TETRA TECH

November 6, 2009

Mr. Michael Norman
Brownfields Project Manager
U. S. Environmental Protection Agency Region 4
61 Forsyth Street, SW, 11th Floor
Atlanta, GA 30303

Subject: **Revised Final Phase II Environmental Site Assessment Report**
Tennessee Wheel and Rubber TBA Site
Nashville, Davidson County, Tennessee
EPA Contract No. EP-W-05-054 (START III Region 4)
Technical Direction Document No. TTEMI-05-003-0052

Dear Mr. Norman:

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) is submitting the revised final Phase II environmental site assessment (ESA) for the Tennessee Wheel and Rubber Targeted Brownfields Assessment (TBA) site in Nashville, Davidson County, Tennessee. The proposed technical approach has been prepared in accordance with the U.S. Environmental Protection Agency (EPA) Performance Work Statement dated December 29, 2005. The final Phase II ESA report summarizes field activities and laboratory analytical results for samples collected on February 25 and 26, 2009 and July 9 through 11, 2009. The revised final report includes minor changes to the text of the report and new Figure 5, which presents the tetrachloroethylene concentrations in on-site soil samples.

Please call me (Sandra Harrigan) at (678) 775-3088 or Tim Ward at (615) 252-4791 if you have any questions or comments regarding the report.

Sincerely,

Sandra J Harrigan

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START III Project Manager

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REVISED FINAL
PHASE II ENVIRONMENTAL SITE ASSESSMENT REPORT

TENNESSEE WHEEL AND RUBBER TBA SITE
NASHVILLE, DAVIDSON COUNTY, TENNESSEE

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 4
Atlanta, Georgia 30303

Contract No.	:	EP-W-05-054
TDD No.	:	TTEMI-05-003-0052
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APPENDICES

EXECUTIVE SUMMARY

This report presents the findings and conclusions of a Phase II environmental site assessment (ESA) conducted at the Tennessee Wheel and Rubber (TNW&R) Targeted Brownfields Assessment (TBA) site, under Contract Number (No.) EP-W-05-054, Technical Direction Document (TDD) No. TTEMI-05-003-0052. The Phase II ESA was conducted by the Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) on behalf of the U.S. Environmental Protection Agency (EPA).

The TNW&R property is located at 817 18th Avenue North in Nashville, Davidson County, Tennessee, in a residential and light industrial area within the city limits of Nashville. The property is an abandoned wheel and caster manufacturing facility that operated for an unknown amount of time. The property is improved with two buildings separated by a central flat, open, concrete area (referred to as the courtyard).

In 2006, EPA initiated an emergency removal action at the property based on releases of potential hazardous substances and oil from drums stored at the property. EPA and Tetra Tech mobilized to the TNW&R property on May 22, 2006, to investigate the property, mitigate ongoing releases, and stabilize the site. Soil samples collected from the property contained measurable concentrations of many metals, including arsenic and lead. Waste samples collected from drums contained 2-butanone (methyl ethyl ketone) at concentrations as high as 3.4 percent; tetrachloroethene (PCE) at concentrations as high as 98.9 percent; toluene at concentrations as high as 90 percent; 2,6-dinitrotoluene at concentrations as high as 2,050 milligrams per kilogram (mg/kg); and 4-nitrophenol at concentrations as high as 10,300 micrograms per liter (µg/L). In addition, Tetra Tech observed two separate fill pipes which led to the discovery of two underground storage tanks (USTs). Approximately 625 gallons of suspected fuel oil was pumped from the two USTs and transported off-site to a recycling facility.

During an October 2008 Phase I site reconnaissance of the property and surrounding area, Tetra Tech observed the fill pipes associated with the suspected USTs, aboveground storage tanks (AST), drums, solid waste, transformers, fluorescent light ballasts, oily water sumps, suspect asbestos-containing material (ACM), and suspect lead-based paint (LBP). EPA tasked Tetra Tech to perform this Phase II ESA to determine whether historical industrial use of the property has impacted on-site subsurface soils and/or groundwater.

On February 25, 2009, Tetra Tech mobilized to the property to complete the Phase II ESA in accordance with the EPA-approved Phase II ESA site-specific sampling plan (SSSP) dated February 24, 2009. A total of 18 soil borings were advanced across the property; groundwater was not encountered in any of the soil borings.

All soil samples were analyzed for volatile organic compounds (VOC) by EPA SW-846 Method 8260B (with Collection Method 5035B), polynuclear aromatic hydrocarbons (PAH) by EPA SW-846 Method 8270C, and Resource Conservation and Recovery Act (RCRA) metals by EPA SW-846 Method 6010C/7471B. Soil samples collected from Stations TWR10 and TWR13 were also analyzed for polychlorinated biphenyls (PCB) by EPA SW-846 Method 8082.

The soil sample analytical results were compared to industrial soil screening levels listed in the EPA *Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites* Table, dated September 5, 2008.

Multiple VOC constituents were detected above the laboratory detection limits in each soil boring. PCE was detected at 7.25 mg/kg in soil sample TWR-10-0-5; this result exceeded the RSL of 2.7 mg/kg. The remaining VOC detections were below the applicable RSLs.

Multiple PAH constituents were detected above the laboratory detection limits in soil sample TWR-09-0-5. The PAH constituent benzo(a)pyrene was detected at 0.366 mg/kg; this result exceeded the RSL of 0.21 mg/kg. The remaining PAH detections were below the applicable RSLs. It should be noted that although the analytical results for PAH constituents benzo(a)pyrene and dibenz(a,h)anthracene were not detected in soil sample TWR-08-0-5, the minimum reporting limit exceeded the RSL for each constituent because the sample was diluted by a factor of 10. PCBs were not detected above the laboratory detection limit in the soil borings.

Multiple RCRA metals were detected above the laboratory detection limits in each soil boring. Arsenic was detected at concentrations in each soil boring that exceeded the RSL of 1.6 mg/kg. Tetra Tech consulted the Tennessee Department of Environmental and Conservation (TDEC) Division of Geology publication titled *Hazardous Trace Elements in Tennessee Soils and Other Regolith*, dated 2001, for information pertaining to background concentrations of arsenic in Davidson County, Tennessee. Tetra Tech reviewed this publication because background soil concentrations of metals in Tennessee commonly exceed the corresponding RSLs. According to the publication, background concentrations of arsenic in Davidson County range from 1.0 to 20.0 mg/kg (mean 6.75 mg/kg). The detected arsenic concentrations in each soil boring exceeded the mean background arsenic concentration for Davidson County (6.75 mg/kg);

however, only soil samples TWR-03-5-10, TWR-04-5-10, TWR-12-5-10, TWR-13-5-10, TWR-14-5-10, TWR-20-5-10, and TWR-21-5-10 exceeded the highest background arsenic concentration (20.0 mg/kg).

Based on the results of the February 2009 Phase II ESA sampling event, the VOC constituent PCE, the PAH constituent benzo(a)pyrene, and arsenic were detected at concentrations above regulatory limits. The elevated PCE concentration was detected in soil sample TWR-10-0-5; this sample was collected in the central portion of the north building. The elevated benzo(a)pyrene concentration was detected in soil sample TWR-09-0-5; this sample was collected in the central portion of the north building. Elevated arsenic concentrations were detected in all soil samples. Therefore, Tetra Tech recommends that future land-use plans address the soil contamination through either deed restrictions and activity and use limitations, a soil operation and maintenance (O&M) plan, or a combination of both. If future development or demolition plans for the property entail invasive dirt moving or excavation, dust control technologies are recommended to prevent contaminated soil from blowing into the neighborhoods surrounding the site.

From July 9 through July 11, 2009, a membrane interface probe (MIP) investigation was conducted at TNW&R. A total of 16 MIP borings (MIP-1 to MIP16) were advanced in a grid pattern with 10-foot and 20-foot radii. MIP-1 was located at the TWR-10 boring location from the February Phase II ESA investigation; therefore, MIP-1 served as a baseline to compare the other MIP borings. This location was chosen due to an elevated PCE concentration of 7.25 ppm detected during the February sampling event. Each subsequent boring was compared to milllivolts readings from MIP-1 boring.

On July 10 and 11, 2009 confirmatory sampling was conducted to confirm the MIP readings. A total of ten locations were selected based on the MIP responses.

Soil sample analysis results confirm the presence of PCE at all the boring locations sampled. All confirmation soil samples were below the EPA RSL of 2.7 mg/kg for PCE in industrial soil except for sample MIP-14-1-6. MIP-14-1-6 had a total concentration of 116 mg/kg PCE.

In addition to the soil sampling conducted during the Phase II ESA, Tetra Tech was tasked with determining the orientation of two suspected USTs located on the property. Tetra Tech utilized an excavation subcontractor to excavate around the areas of two fill ports and USTs in an effort to visually inspect the tanks. At both locations, Tetra Tech found (1) a rough-formed concrete pad approximately 2 to 3 feet below ground surface; (2) non-native sand immediately beneath the concrete pad; and (3) a protective, painted steel barrier around each fill port that appeared to be attached to the concrete pad. Based on previous experience, Tetra Tech has found that a concrete pad is typically placed over a UST to prevent the tank from rising to the surface during periods of heavy rain and/or vadose zone shift. In addition, the subsurface concrete pad may have interfered with the electromagnetic survey conducted on February 5, 2009. Finally, fine-grain sand is typically associated with UST installation in general. Therefore, based on the field observations, Tetra Tech was able to estimate the orientation of the USTs.

1.0 INTRODUCTION

Under Contract Number (No.) EP-W-05-054, Technical Direction Document (TDD) No. TTEMI-05-003-0052, the U.S. Environmental Protection Agency (EPA) tasked the Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) to conduct Phase II environmental site assessment (ESA) activities, including collection of samples, at the Tennessee Wheel and Rubber (TNW&R) Targeted Brownfields Assessment (TBA) site.

This Phase II ESA report summarizes field activities and laboratory analytical results for samples collected on February 25 to 26, 2009. Phase II ESA activities were conducted in accordance with procedures described in the American Society for Testing and Materials (ASTM) International Standard: E 1903-97 Standard Practice for Environmental Site Assessment Process, and the EPA Region 4 Science and Ecosystem Support Division (SESD) Field Branches Quality System and Technical Procedures (References [Refs.] 1; 2). Phase II ESA activities included the following:

- Collecting environmental samples
- Using safety instrumentation and field screening methods to screen the property
- Photographing and documenting site features and sampling locations
- Preparing sampling and chain-of-custody documentation
- Assessing the need for remedial action

Analytical results from samples collected during the Phase II ESA were used to evaluate the presence and nature of contamination at the TNW&R property and to determine the need for remedial action at the site.

Tetra Tech conducted a direct push investigation at the TNW&R site during the week of July 6, 2009 to further define the extent of PCE contamination. The field investigation included the completion of a membrane interface probe (MIP) investigation, as well as the collection of confirmation soil samples. MIP technology provides for the simultaneous collection of soil gas information and lithologic data; the MIP data is typically provided as a measure of volatile organic compounds (VOC) concentrations in millivolts (mV). This results in the completion of cross sections for over-burden soils that include an estimate of potential contaminant distribution in the subsurface. Results of the MIP investigation were compiled and evaluated to delineate the extent of VOC contamination and to determine locations where confirmation soil samples would be collected.

Tetra Tech used information gathered during the investigation to prepare this Phase II ESA report, which is organized as follows:

- Section 2.0 describes the property background information, including site history, previous investigations, and site reconnaissance activities.
- Section 3.0 discusses field activities conducted in February 2009, consisting of surface and subsurface soil sampling, as well as the analytical results of the surface and subsurface soil samples.
- Section 4.0 discusses the MIP field activities conducted in July 2009, as well as the analytical results of the confirmation soil samples.
- Section 5.0 discusses the exploration activities around the two suspected underground storage tanks (USTs) on the property.
- Section 6.0 provides a discussion of findings and conclusions.
- Section 7.0 provides a list of references consulted.
- Figures and tables are presented in Appendices A and B, respectively. A photographic documentation log is provided in Appendix C, and copies of field logbook notes are provided in Appendix D. Appendix E presents the MIP graphs, Appendix F presents the Tetra Tech data validation reports and Appendix G provides the laboratory data packages, as received from the laboratory. Appendix H presents a listing of witness names.

2.0 BACKGROUND INFORMATION

The TNW&R property is located at 817 18th Avenue North in Nashville, Davidson County, Tennessee, in a residential and light industrial area within the city limits of Nashville (see Figure 1 in Appendix A). The property is an abandoned wheel and caster manufacturing facility that operated for an unknown amount of time. The property is bounded to the north by vacant and residential lots with Herman Street beyond; 18th Street North to the east; by Tennessee Central Railroad to the south, with an industrial facility beyond; and by 19th Street North to the west (see Figure 2 in Appendix A). The Nashville Metro on-line interactive property map shows that the property is zoned industrial restrictive, is 1.97 acres in area with a frontage of 200 feet and sides of 104 feet in length, is currently owned by the TNW&R Company, and was acquired by TNW&R on March 1, 1966. Sometime after the company acquired the property, TNW&R Company filed for bankruptcy. The property is improved with two buildings separated by a central flat, open, concrete area (referred to as the courtyard). Each building contains multiple rooms that were previously used for manufacturing, product finishing, and offices. Currently, several piles of debris are located in each of the buildings and in various areas on the property (Ref. 3).

In 2006, EPA initiated an emergency removal action at the property based on observed releases of suspected potentially hazardous substances and oil from drums stored at the property. EPA and Tetra Tech START mobilized to the TNW&R property on May 22, 2006, to investigate the property, mitigate ongoing releases, and stabilize the site. Analytical results provided to EPA indicated the presence of numerous hazardous substances and prompted additional actions after the initial response to stabilize the property. Additional response activities included:

- Clearing and grubbing the north side of the property to extract 229 drums from the overgrown vegetation.
- Pumping portable tanks to impound nonhazardous groundwater and water pumped from drums and containers to the Metro Water Services Publicly Owned Treatment Works in Nashville via a nearby storm drain.
- Transporting and disposing of 96 containers of waste discovered at the property and crushing and disposing approximately 450 empty drums.
- Sampling, pumping, transporting, and recycling 625 gallons of fuel oil identified in two suspected USTs.
- Sampling various solid and liquid waste materials at locations throughout the property (Ref. 3).

Soil samples collected from the property contained measurable concentrations of many metals, including arsenic and lead. Waste samples collected from drums contained 2-butanone (methyl ethyl ketone) at concentrations as high as 3.4 percent; tetrachloroethene (PCE) at concentrations as high as 98.9 percent; toluene at concentrations as high as 90 percent; 2,6-dinitrotoluene at concentrations as high as 2,050 milligrams per kilogram (mg/kg); and 4-nitrophenol at concentrations as high as 10,300 micrograms per liter (μg/L) (Ref. 3).

During the October 2008 Phase I site reconnaissance of the property and surrounding area, Tetra Tech observed the fill pipes associated with the suspect USTs, aboveground storage tanks (ASTs), drums, solid waste, transformers, fluorescent light ballasts, oily water sumps, suspect asbestos-containing material (ACM), and suspect lead-based paint (LBP). Tetra Tech did not observe any stressed vegetation, wetlands, or ponded water (Ref. 4).

3.0 PHASE II ESA SAMPLING ACTIVITIES

This section outlines field observations and sampling procedures used at the site during the February 2009 Phase II ESA. Individual subsections address the sampling investigation and rationale for specific Phase II ESA activities. The Phase II ESA was conducted in accordance with the EPA-approved Phase II ESA site-specific sampling plan (SSSP) dated February 24, 2009 (Ref. 5). Deviations from the SSSP are noted in Section 3.4 of this report. Figure 3 in Appendix A depicts the sampling locations, and Table 1 in Appendix B outlines the number and type of samples collected and describes the sampling locations.

This section also summarizes the results of soil samples submitted for laboratory analysis. Table 3 in Appendix B provides detailed analytical results for each sample and compares them to Industrial Soil Screening Levels listed in the EPA *Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites* table (Ref. 6). Copies of the laboratory data sheets and chain-of-custody forms are located in Appendix F.

3.1 SAMPLE COLLECTION METHODOLOGY AND PROCEDURES

Eighteen soil borings were advanced by track-mounted GeoProbe® sampling equipment supplied by M&W Drilling, LLC of Knoxville, Tennessee. The GeoProbe® is a direct-push technology (DPT) device that pushes a thin steel alloy rod into the soil to the desired depth for sampling. Hollow sampling tubes five feet in length are then pushed into the soil to collect nearly undisturbed soil samples. To prevent cross contamination between borings, the steel push rods and hollow samplers are decontaminated by washing in a solution of water and Alconox and double rinsing with potable water in accordance with the EPA Region 4 SESD Field Branches Quality System and Technical Procedures, Field Equipment Cleaning and Decontamination, SESDPROC-205-R1. Prior to sample collection, a clean, disposable acetate sample liner was inserted into the hollow sampler.

Each 5-foot column of collected soil was observed for soil characteristics and placed in a disposable aluminum tray. The EPA-approved Phase II ESA SSSP indicated the collected soil would be screened in the field with a photoionization detector (PID) to determine the interval for sample collection. However, sampling staff experienced inclement weather during both days of sampling, and the PID malfunctioned due to the higher volume of water vapor in the atmosphere (a PID is sensitive to highly humid conditions). Therefore, Tetra Tech collected soil samples from specific depth intervals utilizing the following justifications (in order of priority, high to low):

- Depth intervals exhibiting visual or olfactory indications of contamination;
- Depth intervals prone to future worker exposure, typically the 0 to 5 feet below ground surface (bgs) interval beneath the concrete floors of the two on-site buildings; or
- Depth intervals subject to subsurface impact, typically the 5 to 10 feet bgs interval outside the buildings and around the suspected USTs.

Only one soil boring location, TWR08, exhibited visual and/or olfactory indications of contamination; the 0 to 5 feet depth interval at TWR08 was selected due to these indications of contamination. Once the sample interval was established, the sample for VOC analysis was collected directly from the soil boring. The remaining soil was homogenized in disposable aluminum trays then placed in laboratory-supplied containers, and preserved with ice.

Soil borings were advanced inside the footprint of the property buildings, outside the property buildings (the courtyard), and around the two suspected USTs. A summary of soil sample locations, sample depth intervals, and sample location rationale is provided in Table 1 in Appendix B.

Groundwater was not encountered during advancement of the soil borings; therefore, groundwater samples were not collected during this sampling event. All borings were advanced to a maximum depth of 10 feet bgs with the exception of Station TWR02, where refusal was encountered at 9 feet bgs. The soil borings were advanced to 10 feet, rather than 8 feet as stated in the Phase II ESA SSSP, due to the driller's use of 5-foot tooling sections and acetate sample liners. The 5-foot soil intervals were collected to simplify and expedite field operations.

A duplicate soil sample was collected from Station TWR18; this duplicate soil sample is identified as TWR-21-5-10. A matrix spike/matrix spike duplicate (MS/MSD) was performed for Station TWR20.

The Phase II ESA sampling locations are depicted on Figure 3 in Appendix A and summarized in Table 1 in Appendix B. Tetra Tech followed sample collection procedures outlined in the SSSP dated February 24, 2009, and performed sampling activities in accordance with EPA Region 4 SESD Field Branches Quality System and Technical Procedures, Soil Sampling, SESDPROC-300-R1 (Refs. 2; 5). The photographic documentation log and field logbook notes for the Phase II ESA sampling event are located in Appendices C and D, respectively.

3.2 ANALYTICAL SUPPORT AND METHODOLOGY

Tetra Tech procured TestAmerica Laboratories, Inc. (TestAmerica), of Nashville, Tennessee, to analyze soil samples collected from the TNW&R site. All soil samples were analyzed for the following:

- VOC by EPA SW-846 Method 8260B (with Collection Method 5035B)
- Polynuclear aromatic hydrocarbons (PAH) by EPA SW-846 Method 8270C
- Resource Conservation and Recovery Act (RCRA) metals by EPA SW-846 Method 6010C/7471B

VOC sampling by Collection Method 5030B utilizes a disposable Terra Core sampler to minimize volatilization. The Terra Core sampler is a one-time use transfer tool, designed to take soil samples and transfer them to the appropriate containers for in-field preservation. The Terra Core sampler collects an approximate 5-gram sample, which is then transferred to one of three 40-mililiter (mL) vials that contain either sodium bisulfate or methanol preservatives, and a Teflon stirring bar. A new Terra Core sampler was used at each sampling location.

Soil samples collected from Station TWR10 and TWR13 were also analyzed for polychlorinated biphenyls (PCB) by EPA SW-846 Method 8082. Tetra Tech conducted data validation of the TestAmerica analytical data packages and the Tetra Tech data validation reports are provided in Appendix E. The analytical data packages as received from the laboratory are provided in Appendix F.

3.3 ANALYTICAL DATA QUALITY AND DATA QUALIFIERS

The text and analytical data tables presented in this report provide some concentrations of inorganic and organic parameters as qualified with a "J", "J+", "J-", or "U." The "J" notation indicates that the analyte was positively identified; however, the reported value is an estimate. The "J+" notation indicates that the analyte was positively identified; however, the reported value is an estimate and is possibly biased high. The "J-" notation indicates that the analyte was positively identified; however, the reported value is an estimate and is possibly biased low. The "U" notation indicates that the analyte was analyzed for but not detected; the number reported is the laboratory-derived reporting limit for the constituent in that sample. Analytical data sheets with hand entered data qualifiers are contained in Enclosure 1 of Appendix E. The complete set of analytical data as received from the laboratory is provided in Appendix F.

3.4 DEVIATIONS FROM THE SAMPLING PLAN

The following deviations from the Phase II ESA SSSP were noted:

- A background sample location (Station TWR01) was proposed in the SSSP. However, after submittal of the SSSP, it was determined that a background sample would not be required because the focus of the Phase II ESA was to determine the presence or absence of contamination on the property. Therefore, no samples were collected from Station TWR01.

- Station TWR11 was formerly believed to be on a portion of the property; however, closer examination of parcel maps and property boundaries revealed that Station TWR11 was located on a parcel adjacent to the site and not within the TNW&R property boundaries. Therefore, Station TWR11 was not sampled.

- A PID was proposed for use as a screening tool to identify soil intervals that exhibited detectable VOC emissions. However, sampling staff experienced inclement weather during both days of sampling, and the PID malfunctioned due to the higher volume of water vapor in the atmosphere (a PID is sensitive to highly humid conditions). Therefore, Tetra Tech collected soil samples from specific depth intervals utilizing the following justifications (in order of priority, high to low): depth intervals exhibiting visual or olfactory indications of contamination; depth intervals prone to future worker exposure; or depth intervals subject to subsurface impact. Determination of sampling intervals is discussed in further detail in Section 3.1.

- The SSSP designated the following soil sampling location stations for groundwater sampling: TWR02, TWR03, TWR05, TWR09, TWR13, TWR14, TWR16, TWR17, TWR18, and TWR20. However, groundwater was not encountered during advancement of the soil borings in these or any of the remaining soil boring stations. Therefore, groundwater samples were not collected.

- A MS/MSD soil sample was proposed for each analyte collected from soil sample TWR-20-MS/MSD. However, a set of 40-ml vials for VOC soil sample collection was not available during collection of the MS/MSD soil sample; therefore, only PAH and RCRA metals samples were collected from the TWR-20 MS/MSD soil sample.

3.5 PHASE II ESA SAMPLING EVENT ANALYTICAL RESULTS

This Phase II ESA was not intended to quantify a vertical and horizontal delineation of potential constituent of concern contamination on the property. The purpose of this assessment was to (1) assess the presence or absence of such contamination at the property and determine to what degree the laboratory analytical results of samples were in excess or not in excess of applicable local, state, and federal standards, and (2) provide a general delineation of the potential constituents of concern contamination. This report and its findings should not be construed as a determination that all or portions of the property are free of such contamination. This report relies on data obtained from advancing small-diameter borings and obtaining soil samples from those borings. The data represent conditions of soil only at the sample locations at the time of the assessment.

Multiple VOC constituents were detected above the laboratory detection limits in each soil boring. The VOC constituent PCE was detected at 7.25 milligrams per kilograms (mg/kg) in soil sample TWR-10-0-5; this detection exceeded the RSL of 2.7 mg/kg. The remaining VOC detections were below the applicable RSLs.

Multiple PAH constituents were detected above the laboratory detection limits in soil sample TWR-09-0-5. The PAH constituent benzo(a)pyrene was detected at 0.366 mg/kg; this detection exceeded the RSL of 0.21 mg/kg. The remaining PAH detections were below the applicable RSLs. It should be noted that although the analytical results for PAH constituents benzo(a)pyrene and dibenz(a,h)anthracene were not detected in soil sample TWR-08-0-5, the minimum reporting limit exceeded the RSL for each constituent because the sample was diluted by a factor of 10. PCBs were not detected above the laboratory detection limit in the soil borings.

Multiple RCRA metals were detected above the laboratory detection limits in each soil boring. Arsenic was detected in each soil boring at concentrations that exceeded the RSL of 1.6 mg/kg. Tetra Tech consulted the Tennessee Department of Environmental and Conservation (TDEC) Division of Geology publication titled *Hazardous Trace Elements in Tennessee Soils and Other Regolith* (Ref. 7) for information pertaining to background concentrations of arsenic in Davidson County, Tennessee. Tetra Tech reviewed this publication because background soil concentrations of metals in Tennessee commonly exceed the corresponding RSLs. According to the publication, background concentrations of arsenic in Davidson County range from 1.0 to 20.0 mg/kg (mean 6.75 mg/kg). The detected arsenic concentrations in each soil boring exceeded the mean background arsenic concentration for Davidson County (6.75 mg/kg); however, only soil samples TWR-03-5-10, TWR-04-5-10, TWR-12-5-10, TWR-13-5-10, TWR-14-5-10, TWR-20-5-10, and TWR-21-5-10 exceeded the highest background arsenic concentration (20.0 mg/kg), as shown in Figure 3.

4.0 MEMBRANE INTERFACE PROBE INVESTIGATION

This section outlines MIP field observations and confirmation sampling procedures conducted at the site during the July 2009 MIP investigation. The MIP investigation was conducted in an effort to delineate the elevated PCE concentrations in soil identified during the February 2009 Phase II ESA sampling event. Individual subsections address the MIP technology, MIP investigation, confirmation soil sampling, and analytical results. The MIP investigaton was conducted in accordance with the EPA-approved final SSSP addendum dated July 6, 2009 (Ref. 8). During the MIP investigation, the number of MIP borings advanced deviated from the final SSSP addendum. Specifically, four of the 13 initial MIP borings were relocated between 10 and 35 feet to the south in order to delineate potential subsurface soil contamination in the courtyard between the two on-site buildings. Figure 4 in Appendix A depicts the MIP borings and confirmation soil sampling locations, and Table 2 in Appendix B outlines the number and type of confirmation soil samples collected and describes the sampling locations.

4.1 MIP TECHNOLOGY

The MIP is a direct push tool that produces continuous chemical and physical logs of the vadose and saturated zones. It locates VOCs in-situ and indicates where they occur relative to the geologic and hydrologic units. Vertical profiles, transects, 3D images and maps can all be made from the electronic data generated by the MIP logs. Its unique capability of providing reliable, real-time information allows the user to make better and timely decisions while the team is still in the field. The MIP is a down hole tool that heats the soils and groundwater adjacent to the probe to 120 degrees C. This increases volatility, and the vapor phase diffuses across a membrane into a closed, inert gas loop that carries these vapors to a series of detectors housed at the surface. Continuous chemical logs or profiles are generated from each hole. The MIP technology is only appropriate for (VOCs. The gas stream can be analyzed with multiple detectors; for example, an electron capture detector (ECD) is used to detect chlorinated solvents, a PID is used to detect petroleum hydrocarbons, and a flame ionization detector (FID) is used to detect methane.

The ECD uses a radioactive Beta emitter (electrons) to ionize some of the carrier gas and produce a current between a biased pair of electrodes. When organic molecules contain electronegative functional groups, such as halogens, phosphorous, and nitro groups pass by the detector, they capture some of the electrons and reduce the current measured between the electrodes.

The PID sample stream flows through the detector's reaction chamber where it is continuously irradiated with high energy ultraviolet light. When compounds are present that have a lower ionization potential than that of the irradiation energy (10.2 electron volts with standard lamp), they are ionized. The ions formed are collected in an electrical field, producing an ion current that is proportional to compound concentration. The ion current is amplified and measured by the gas chromatograph's (GC's) electrometer.

The FID consists of a hydrogen/air flame and a collector plate. The effluent from the GC (trunkline) passes through the flame, which breaks down organic molecules and produces ions. The ions are collected on a biased electrode and produce an electric signal.

Detector responses are measured or collected in mV. Detector responses are an indication of relative contaminant responses, but are not a direct 1:1 correlation when compared to parts per million (ppm). Minimum and maximum detector responses are collected at each vertical interval.

Electrical Conductivity (EC) data is measured/collected in milli-siemens per Meter (ms/M). The conductivity of soils is different for each type of media. Finer grained sediments, such as silts or clays, will have a higher EC signal. Coarser grained sediments, sands, and gravel will have a lower EC signal. The coarser grained sediments will allow the migration of contaminants and the finer grained sediments will trap the contaminant.

4.2 MIP INVESTIGATION

The TNW&R MIP investigation was conducted from July 9 through July 11, 2009. A total of 16 MIP borings (MIP-1 to MIP16) were advanced in a grid pattern with 10-foot and 20-foot radii (see Figure 4 in Appendix A). MIP-1 was located at the TWR-10 boring location from the February Phase II ESA investigation (Figure 3); therefore, MIP-1 served as a baseline to compare the other MIP borings. This location was chosen due to an elevated PCE concentration of 7.25 ppm detected during the February sampling event. Each subsequent boring was compared to mV readings from the MIP-1 boring.

Initially, Tetra Tech advanced MIP borings at 13 discrete locations; including MIP-1. The readings of the initial borings were reviewed and compared to MIP-1; borings MIP-7, MIP-9, MIP-11 were the only borings that did not exceed the maximum detection limit of the ECD ($1.40E^{+7}$ mV). Based on the MIP readings from the initial 13 borings, three supplemental borings were advanced approximately 20 radial feet from three of the outermost initial borings with the highest ECD readings. The supplemental borings were MIP-14, 15, and 16. MIP-14 was located 20 feet southeast of MIP-12, MIP-15 was located 20 feet northeast of MIP-10, and MIP-16 was located 20 feet northwest of MIP-9 (see Figure 4 in Appendix A).

Of the three supplemental borings, MIP-14 was the only boring that exceeded the maximum detection limit of the ECD ($1.40E^{+7}$ mV). This concluded the MIP portion of the investigation and, on July 10 and 11, 2009, confirmatory soil sampling was conducted to compare to the MIP readings.

4.3 MIP CONFIRMATION SOIL SAMPLING

On July 10 and 11, 2009 confirmatory soil sampling was conducted to confirm the MIP readings. A total of ten locations were selected based on the MIP responses (see Table 2 in Appendix B). The confirmation borings were located in approximately a one foot radius of the original MIP boring. This additional boring was required to collect a soil sample from the targeted interval. Locations and depth of samples were based on the individual MIP ECD responses (see MIP graphs in Appendix E). Confirmation soil samples were collected in accordance with the EPA-approved final SSSP, final SSSP addendum, and the EPA Region 4 SESD Field Branches Quality System and Technical Procedures, Soil Sampling, SESDPROC-300-R1 (Refs. 2; 5; 8).

Ten soil borings were advanced using track-mounted GeoProbe® sampling equipment supplied by Vironex, Inc. The GeoProbe® is a DPT device that pushes a thin steel alloy rod into the soil to the desired depth for sampling. Hollow sampling tubes five feet in length are pushed into the soil to collect nearly undisturbed soil samples. To prevent cross contamination between borings, the steel push rods and hollow samplers are decontaminated by washing in a solution of water and Alconox and double rinsing with potable water, in accordance with the EPA Region 4 SESD Field Branches Quality System and Technical Procedures, Field Equipment Cleaning and Decontamination, SESDPROC-205-R1. Prior to sample collection, a clean, disposable acetate sample liner was inserted into the hollow sampler. Each 5-foot column of collected soil was observed for soil characteristics and placed in a disposable aluminum tray for sample collection.

Each confirmation sample location was based on the MIP-ECD response at that location. The sample depth was determined from the interval which exhibited the highest ECD response. For example, boring MIP-1 exhibited the highest ECD response from 5 to 7.5 feet bgs; therefore, it was determined the best interval to sample from MIP-1 was 5 to 10 feet bgs. The additional boring depths were selected in the same manner. The samples were identified by boring number and depth (MIP-1-5-10). The ten borings sampled were MIP-1-5-10, MIP-2-2-7, MIP-4-2-7, MIP-6-3-8, MIP-7-4-9, MIP-10-2-7, MIP-11-6-11, MIP-14-1-6, MIP-15-2-7 and MIP-16-5-10 with a duplicate sample collected from MIP-1 numbered MIP-DUP. Table 2 displays the boring number, total depth of the boring, the ECD response, whether a confirmation sample was collected, sample depth, and sample identification number.

4.4 MIP CONFIRMATION SAMPLE RESULTS

As described in Section 4.3, data collected during the MIP boring phase was used to determine where confirmation soil samples were collected. Graphs of MIP-ECD instrument responses (see Appendix E) were used to determine the depth of soil samples collected. Care was taken to collect samples at the depth that corresponded with the elevated ECD responses. Table 4 in Appendix B presents a summary of the laboratory analysis of the confirmation soil samples collected from the MIP borings. Each of the soil samples was analyzed for VOCs by EPA Method 8260B.

Analytical results of the confirmation soil samples corroborate the presence of PCE in all of the MIP borings where samples were collected for laboratory analysis. All confirmation soil samples were below the EPA RSL of 2.7 mg/kg for PCE in industrial soil except for sample MIP-14-1-6. PCE was detected in confirmation soil sample MIP-14-1-6 at a concentration of 116 mg/kg. The ECD readings in the MIP-14 boring below 6 feet did not exceed the maximum value of $1.40E^{+7}$ mV. Figure 5 in Appendix A presents the MIP confirmation soil samples, and their respective sample depths and PCE concentrations in parts per million. Table 5 in Appendix B presents the ECD readings for all MIP borings and the confirmation soil samples with their corresponding laboratory PEC concentrations.

5.0 UST EXPLORATION

In addition to the Phase II ESA, Tetra Tech was tasked with determining the orientation of two USTs located on the property. Two fill ports, one located north of the property buildings and the second located south of the property buildings, were observed during the initial emergency removal action and then again during the Phase I ESA (Refs. 3; 4). During the 2006 emergency removal action, approximately 625 gallons of fuel oil from the two USTs were pumped and transported to a recycling center. An electromagnetic survey conducted by Tetra Tech on February 5, 2009, was inconclusive regarding the presence and orientation of the USTs.

Tetra Tech utilized an excavation subcontractor to excavate around the areas of the fill ports in an effort to visually inspect the tanks. At both locations, a rough-formed concrete pad was discovered approximately 2 to 3 feet bgs and non-native sand was observed immediately beneath the concrete pad where the sides of the pad were excavated. A protective, painted steel barrier around each fill port appeared to be attached to the concrete pad. At the south UST area, a steel line routed towards the southern building was discovered beneath the concrete pad.

Based on previous experience, Tetra Tech has found that a concrete pad is typically placed over an UST to prevent the tank from rising to the surface during periods of heavy rain and/or vadose zone shift. In addition, the subsurface concrete pad may have interfered with the electromagnetic survey conducted on February 5, 2009. Finally, fine-grain sand is typically associated with UST installation in general.

Therefore, based on the field observations, Tetra Tech was able to estimate the orientation of the USTs. The assumed UST orientation is illustrated on Figure 2 in Appendix A.

6.0 DISCUSSION OF FINDINGS AND CONCLUSIONS

The TNW&R property is located in a residential and light industrial area within the city limits of Nashville, Davidson County, Tennessee. The property is an abandoned wheel and caster manufacturing facility that operated for an unknown period of time. The property is improved with two buildings separated by a central courtyard.

Based on the results of the February 2009 Phase II ESA sampling event, PCE, benzo(a)pyrene, and arsenic were detected at concentrations above EPA RSLs. The elevated PCE concentration was detected in soil sample TWR-10-0-5; this sample was collected in the central portion of the north building. The elevated benzo(a)pyrene concentration was detected in soil sample TWR-09-0-5; this sample was collected in the central portion of the north building. Elevated arsenic concentrations were detected in each soil sample. Therefore, Tetra Tech recommends that future land-use plans address the soil contamination through either deed restrictions and activity and use limitations, a soil operation and maintenance (O&M) plan, or a combination of both. If future development or demolition plans for the property entail invasive activities such as excavation, dust control technologies are recommended to prevent contaminated soil from blowing into the neighborhoods surrounding the site.

Based on the results of the July 2009 Phase II ESA MIP investigation and confirmation soil sampling event, PCE was detected above the EPA RSL in confirmation soil sample MIP-14-1-6, collected in the central portion of the courtyard at a depth of 1 to 6 feet bgs. Sample MIP-14-1-6 was collected about 60 feet south of sample TWR-10-0-5, which was collected during the February 2009 sampling event. TRW-10-0-5 corresponded with the MIP-1 boring during the MIP investigation. Based on the results of the MIP investigation and analytical results of the confirmation soil samples, localized PCE contamination is contained in the shallow subsurface at the TNW&R property. Samples collected deeper than 6 feet bgs did not contain PCE above the EPA RSL. Also PCE was not detected above the RSL in any of the other confirmation soil samples.

In addition to the Phase II ESA, Tetra Tech was tasked to determine the orientation of two USTs located on the property. Tetra Tech utilized an excavation subcontractor to excavate around the areas of two fill ports in an effort to visually inspect the tanks. At both locations, Tetra Tech observed a rough-formed concrete pad approximately 2 to 3 feet bgs and non-native sand immediately beneath the pad where the sides of the concrete pad were excavated. A protective, painted steel barrier around each fill port appeared to be attached to the concrete pad. Based on previous experience, Tetra Tech has found that a concrete pad is typically placed over a UST to prevent the tank from rising to the surface during periods of heavy rain and/or vadose zone shift. In addition, the subsurface concrete pad may have interfered with an electromagnetic survey previously performed that did not show evidence of the USTs, and fine-grain sand is typically associated with UST installation in general. Therefore, based on the field observations, Tetra Tech was able to generalize the UST orientation.

7.0 REFERENCES

1. American Society for Testing and Materials (ASTM). International. Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process. Designation: E 1903-97. Reapproved 2002.

2. U.S. Environmental Protection Agency (EPA). Region 4 Science and Ecosystem Support Division (SESD) Field Branches Quality System and Technical Procedures. February 2008. On-Line Address: http://www.epa.gov/region4/sesd/fbqstp/index.html

3. Tetra Tech EM Inc (Tetra Tech). Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Removal Action Report, Tennessee Wheel and Rubber, Nashville, Davidson County, Tennessee. October 18, 2007.

4. Tetra Tech. Final Phase I Environmental Site Assessment Report, Tennessee Wheel and Rubber TBA, Nashville, Davidson County, Tennessee. January 7, 2009.

5. Tetra Tech. Phase II ESA Site-Specific Sampling Plan, Tennessee Wheel and Rubber, Nashville, Davidson County, Tennessee. February 24, 2009.

6. U.S. Environmental Protection Agency (EPA). Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. September 5, 2008.

7. Kopp, Otto C. Tennessee Department of Environmental and Conservation (TDEC), Division of Geology. Hazardous Trace Elements in Tennessee Soils and Other Regolith. 2001.

8. Tetra Tech. Letter with Attachments to Michael Norman, Brownfields Project Manager, EPA. Subject: Final Site-Specific Sampling Plan Addendum, Tennessee Wheel and Rubber, Nashville, Davidson County, Tennessee. July 6, 2009.

APPENDIX A

FIGURES

(Five Pages)

<u>FIGURE</u>

APPENDIX A

FIGURES

(Five Pages)

FIGURE

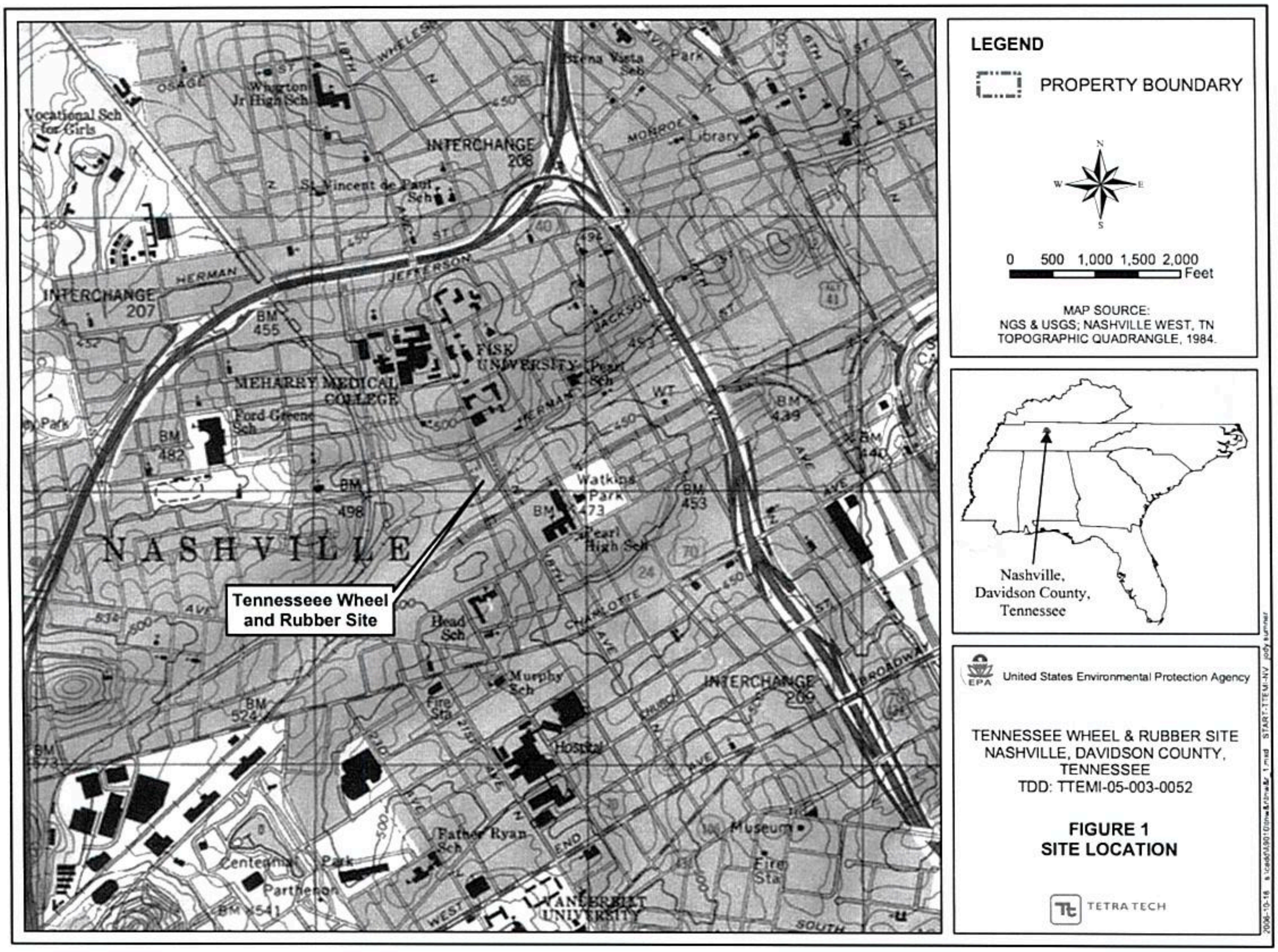


FIGURE 1
SITE LOCATION

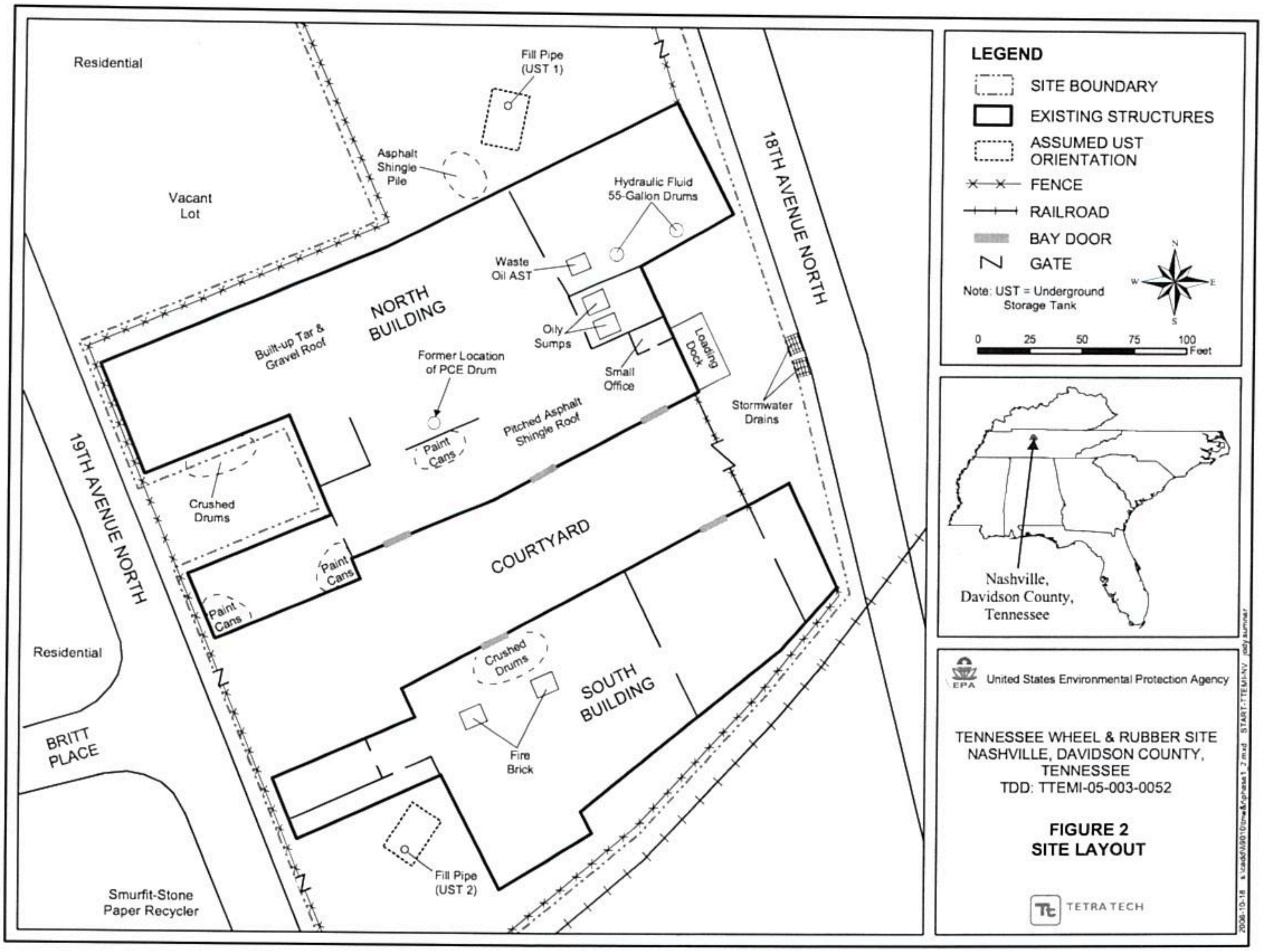
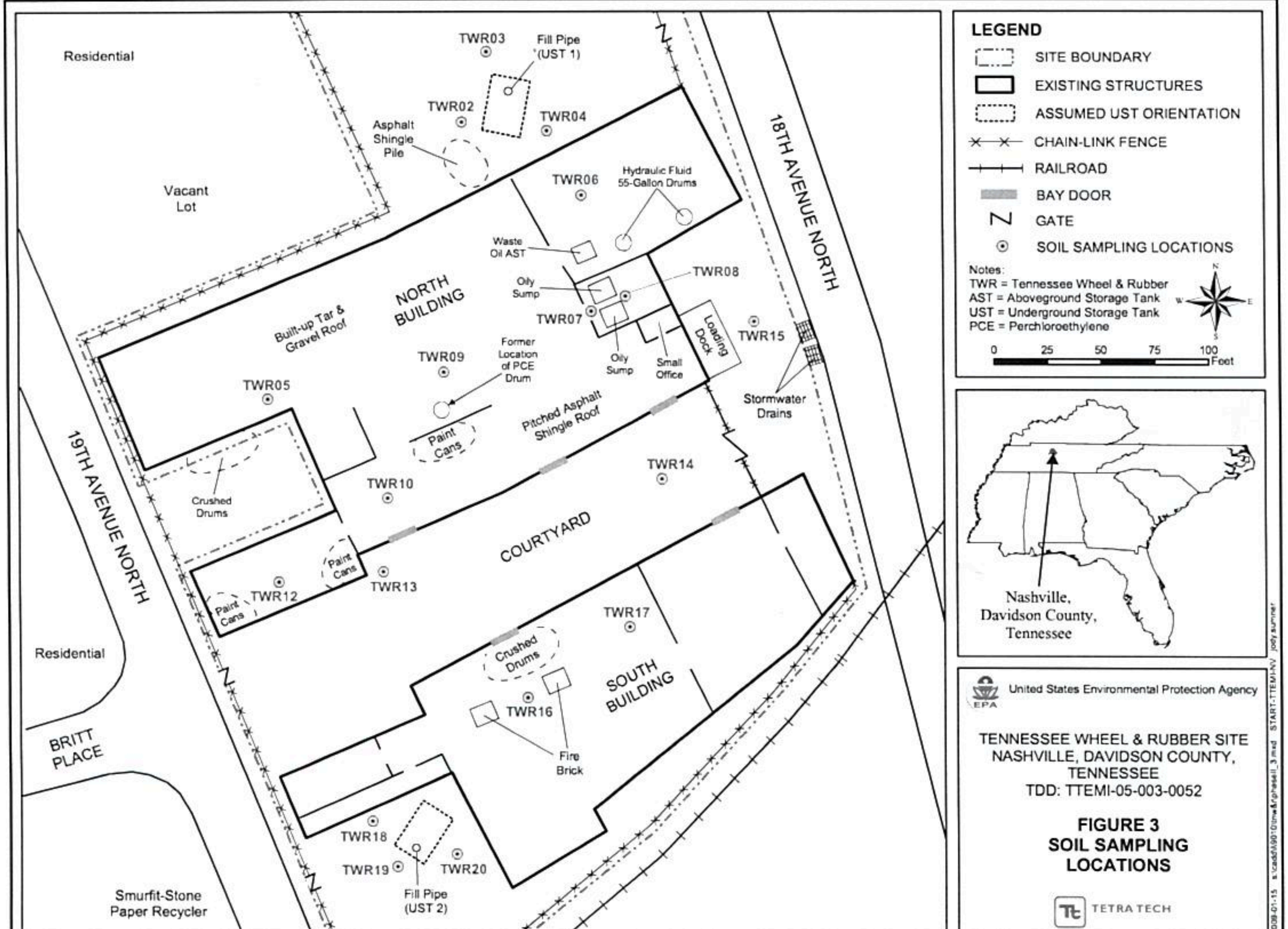


FIGURE 2
SITE LAYOUT

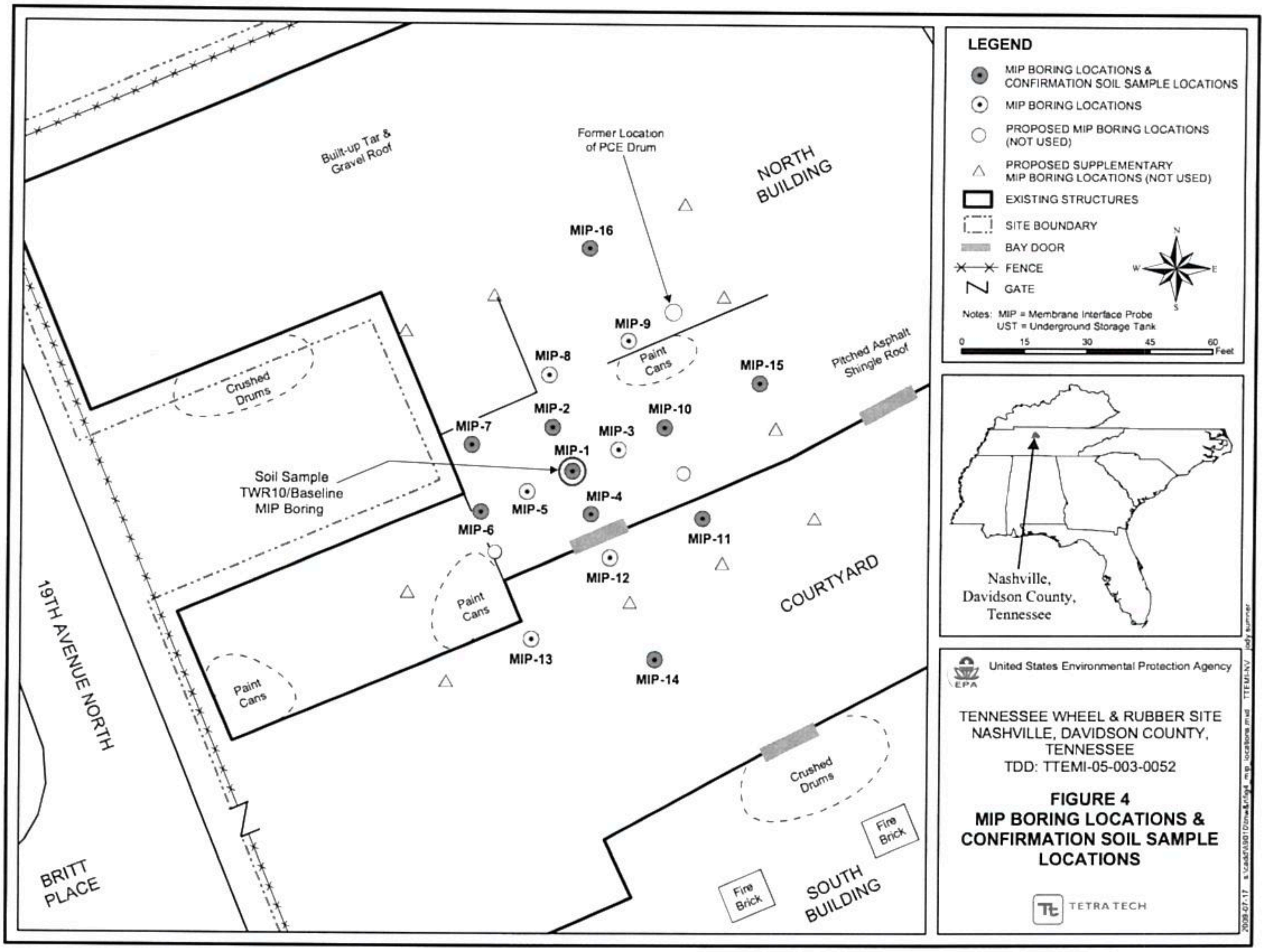


United States Environmental Protection Agency

TENNESSEE WHEEL & RUBBER SITE
NASHVILLE, DAVIDSON COUNTY, TENNESSEE
TDD: TTEMI-05-003-0052

FIGURE 3
SOIL SAMPLING LOCATIONS

TETRA TECH



TENNESSEE WHEEL & RUBBER SITE
NASHVILLE, DAVIDSON COUNTY, TENNESSEE
TDD: TTEMI-05-003-0052

FIGURE 4
MIP BORING LOCATIONS & CONFIRMATION SOIL SAMPLE LOCATIONS

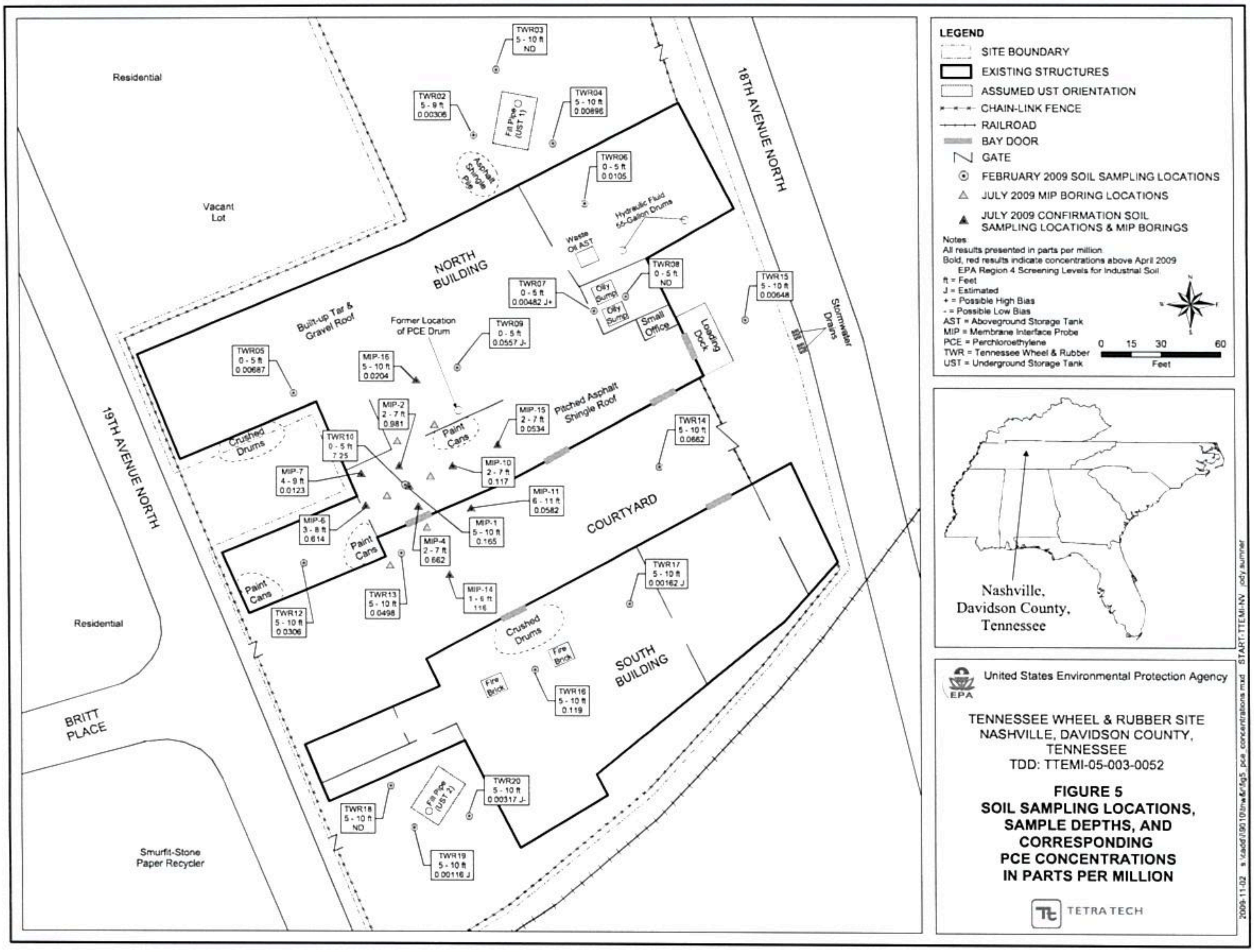


FIGURE 5
SOIL SAMPLING LOCATIONS, SAMPLE DEPTHS, AND CORRESPONDING PCE CONCENTRATIONS IN PARTS PER MILLION

APPENDIX B

TABLES

(14 Pages)

TABLE

TABLE 1
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FEBRUARY 2009 SOIL SAMPLING LOCATIONS AND RATIONALE

Station ID	Sample ID	Sample Depth (feet)	Sample Type	Sample Location	Rationale
TWR01	NA	NA	NA	NA	Station TWR01 was not sampled because a background sample was not needed
TWR02	TWR-02-5-9	5 to 9	Grab	Southwest of UST 1	Determine presence or absence of soil contamination.
TWR03	TWR-03-5-10	5 to 10	Grab	North of UST 1	Determine presence or absence of soil contamination.
TWR04	TWR-04-5-10	5 to 10	Grab	Southeast of UST 1	Determine presence or absence of soil contamination.
TWR05	TWR-05-0-5	0 to 5	Grab	North building, northwestern portion	Determine presence or absence of soil contamination.
TWR06	TWR-06-0-5	0 to 5	Grab	North building, northeastern portion	Determine presence or absence of soil contamination.
TWR07	TWR-07-0-5	0 to 5	Grab	North building, near the oily sumps	Determine presence or absence of soil contamination.
TWR08	TWR-08-0-5	0 to 5	Grab	North building, near the oily sumps	Determine presence or absence of soil contamination.
TWR09	TWR-09-0-5	0 to 5	Grab	North building, near the former location of the PCE drum	Determine presence or absence of soil contamination.
TWR10	TWR-10-0-5	0 to 5	Grab	North building, central portion	Determine presence or absence of soil contamination.
TWR11	NA	NA	NA	NA	Station TRW11 is located on an adjacent property; therefore, it was not sampled.

TABLE 1
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FEBRUARY 2009 SOIL SAMPLING LOCATIONS AND RATIONALE

Station ID	Sample ID	Sample Depth (feet)	Sample Type	Sample Location	Rationale
TWR12	TWR-12-5-10	5 to10	Grab	North building, southwest corner near the paint cans	Determine presence or absence of soil contamination.
TWR13	TWR-13-5-10	5 to 10	Grab	Courtyard, western portion	Determine presence or absence of soil contamination.
TWR14	TWR-14-5-10	5 to 10	Grab	Courtyard, eastern portion	Determine presence or absence of soil contamination.
TWR15	TWR-15-5-10	5 to 10	Grab	East of the north building, near the loading dock	Determine presence or absence of soil contamination.
TWR16	TWR-16-0-5	0 to 5	Grab	South building, near the fire brick	Determine presence or absence of soil contamination.
TWR17	TWR-17-5-10	5 to 10	Grab	South building, central portion	Determine presence or absence of soil contamination.
TWR18	TWR-18-5-10 TWR-21-5-10	5 to 10	Grab	North of UST 2	Determine presence or absence of soil contamination. Sample TWR-21-5-10 is a duplicate of sample TWR-18-5-10.
TWR19	TWR-19-5-10	5 to 10	Grab	West of UST 2	Determine presence or absence of soil contamination.
TWR20	TWR-20-5-10	5 to 10	Grab	South of UST 2	Determine presence or absence of soil contamination.

Notes:

ID = Identification
NA = Not Applicable
PCE = Tetrachloroethene
TWR = Tennessee Wheel and Rubber TBA

UST 1 = Underground storage tank located on northern portion of the site
UST 2 = Underground storage tank located on southern portion of the site

TABLE 2
PHASE II ENVIRONMENTAL SITE ASSESSMENT
MEMBRANE INTERPHASE PROBE BORINGS AND CONFIRMATION SOIL SAMPLING LOCATIONS AND RATIONALE

Boring Number	Confirmation Sample ID	Total Boring Depth (feet)	Sample Depth (feet)	ECD Response (mV)	Sample Location	Rationale
MIP-1	MIP-1-5-10	16.40	5 to 10	>1.40E+07	North building, central portion	Determine vertical and horizontal extent of soil contamination.
MIP-2	MIP-2-2-7	16.95	2 to 7	>1.40E+07	North building, central portion, north of MIP-1	Determine vertical and horizontal extent of soil contamination.
MIP-3	NA	21.65	NA	NA	North building, central portion, east of MIP-1	Determine vertical and horizontal extent of soil contamination.
MIP-4	MIP-4-2-7	18.35	2 to 7	>1.40E+07	North building, central portion, south of MIP-1	Determine vertical and horizontal extent of soil contamination.
MIP-5	NA	18.45	NA	NA	North building, central portion, west of MIP-1	Determine vertical and horizontal extent of soil contamination.
MIP-6	MIP-6-3-8	20.45	3 to 8	>1.40E+07	North building, central portion, west of MIP-5	Determine vertical and horizontal extent of soil contamination.
MIP-7	MIP-7-4-9	21.35	4 to 9	>1.20E+07	North building, central portion, west of MIP-2	Determine vertical and horizontal extent of soil contamination.
MIP-8	NA	17.55	NA	NA	North building, central portion, north of MIP-2	Determine vertical and horizontal extent of soil contamination.
MIP-9	NA	10.35	NA	NA	North building, central portion, east of MIP-8	Determine vertical and horizontal extent of soil contamination.
MIP-10	MIP-10-2-7	17.45	2 to 7	>1.40E+07	North building, central portion, east of MIP-3	Determine vertical and horizontal extent of soil contamination.
MIP-11	MIP-11-6-11	20.35	6 to 11	>3.50E+06	Courtyard, southeast of MIP-4	Determine vertical and horizontal extent of soil contamination.
MIP-12	NA	20.15	NA	NA	Courtyard, south of MIP-4	Determine vertical and horizontal extent of soil contamination.
MIP-13	NA	17.05	NA	NA	Courtyard, southwest of MIP-4	Determine vertical and horizontal extent of soil contamination.
MIP-14	MIP-14-1-6	18.85	1 to 6	>1.40E+07	Courtyard, south of MIP-12	Determine vertical and horizontal extent of soil contamination.
MIP-15	MIP-15-2-7	21.65	2 to 7	>5.00E+06	North building, central portion, east of MIP-10	Determine vertical and horizontal extent of soil contamination.
MIP-16	MIP-16-5-10	21.55	5 to 10	>2.00E+06	North building, central portion, north of MIP-9	Determine vertical and horizontal extent of soil contamination.

TABLE 2
PHASE II ENVIRONMENTAL SITE ASSESSMENT
MEMBRANE INTERPHASE PROBE BORINGS AND CONFIRMATION SOIL SAMPLING LOCATIONS AND RATIONALE

Notes:

>	=	Greater than
E	=	Exponent
ECD	=	Electron capture detector
ID	=	Identification
MIP	=	Membrane Interface Probe
NA	=	Not applicable

TABLE 3
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FEBRUARY 2009 ANALYTICAL RESULTS FOR SOIL SAMPLES

Analyte	EPA Regional Screening Levels Industrial Soil	TWR-02-5-9	TWR-03-5-10	TWR-04-5-10	TWR-05-0-5
Volatile Organic Compounds (mg/kg)					
1,2,4-Trimethylbenzene	280	0.00334	0.00387	0.00221	0.0112
1,3,5-Trimethylbenzene	200	0.00148 J	0.00184	0.00121 J	0.00550
2-Butanone	190,000	0.0506 U	0.0438 U	0.0536 U	0.0493 U
4-Methyl-2-pentanone	52,000	0.0506 U	0.0438 U	0.0536 U	0.0493 U
Acetone	610,000	0.0411 J	0.0429 J	0.0536 U	0.0411 J
Benzene	5.6	0.00217	0.00277	0.00256	0.00853
Carbon disulfide	3,000	0.00115 J	0.00104 J	0.00169 J	0.00364 J
Ethylbenzene	29	0.00202 U	0.000991 J	0.00214 U	0.00353
Isopropylbenzene	11,000	0.00202 U	0.00175 U	0.00214 U	0.00181 U
Naphthalene	20	0.00506 U	0.00438 U	0.00536 U	0.00453 U
n-Butylbenzene	NE	0.00202 U	0.00175 U	0.00214 U	0.00181 U
n-Propylbenzene	NE	0.00202 U	0.00175 U	0.00214 U	0.000807 J
sec-Butylbenzene	NE	0.00202 U	0.00175 U	0.00214 U	0.00181 U
Tetrachloroethene	2.7	0.00306	0.00175 U	0.00896	0.00687
Toluene	46,000	0.00540	0.00660	0.00431	0.0166
Trichloroethene	14	0.00202 U	0.00175 U	0.00214 U	0.00197 U
Xylenes, total	2,600	0.00750	0.00908	0.00483 J	0.0226
Polycyclic Aromatic Hydrocarbons (mg/kg)					
Benzo (a) anthracene	2.1	0.0859 U	0.0798 U	0.0909 U	0.0792 U
Benzo (a) pyrene	0.21	0.0859 U	0.0798 U	0.0909 U	0.0792 U
Benzo (b) fluoranthene	2.1	0.0859 U	0.0798 U	0.0909 U	0.0792 U
Benzo (g,h,i) perylene	NE	0.0859 U	0.0798 U	0.0909 U	0.0792 U
Benzo (k) fluoranthene	21	0.0859 U	0.0798 U	0.0909 U	0.0792 U
Chrysene	210	0.0859 U	0.0798 U	0.0909 U	0.0792 U
Dibenz (a,h) anthracene	0.21	0.0859 U	0.0798 U	0.0909 U	0.0792 U
Fluoranthene	22,000	0.0859 U	0.0798 U	0.0656 J	0.0792 U
Indeno (1,2,3-cd) pyrene	2.1	0.0859 U	0.0798 U	0.0909 U	0.0792 U
Phenanthrene	NE	0.0859 U	0.0798 U	0.0909 U	0.0792 U
Pyrene	17,000	0.0859 U	0.0798 U	0.0570 J	0.0792 U
RCRA Metals (mg/kg)					
Arsenic	1.6	**19.0 J+**	**20.9 J+**	**36.8 J+**	**10.8 J+**
Barium	190,000	683 J+	659 J+	294 J+	266 J+
Cadmium	810	12.8 U	12.0 U	13.7 U	1.19 U
Chromium	1,400	15.7 J+	26.2 J+	15.9 J+	22.2 J+
Lead	800	20.3	18.0	22.8	20.4
Mercury	28	0.130 U	0.119 U	0.137 U	0.120 U
Selenium	5,100	25.7 U	24.0 U	27.4 U	2.13 J+

TABLE 3
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FEBRUARY 2009 ANALYTICAL RESULTS FOR SOIL SAMPLES

Analyte	**EPA Regional Screening Levels Industrial Soil**	**TWR-06-0-5**	**TWR-07-0-5**	**TWR-08-0-5**	**TWR-09-0-5**
Volatile Organic Compounds (mg/kg)					
1,2,4-Trimethylbenzene	280	0.0102	0.114 U	0.0957 U	0.110 U
1,3,5-Trimethylbenzene	200	0.00480	0.114 U	0.0957 U	0.00217 U
2-Butanone	190,000	0.0494 U	0.0486 U	0.00944 J	0.0542 U
4-Methyl-2-pentanone	52,000	0.0494 U	0.00505 J+	0.0492 U	0.0542 U
Acetone	610,000	0.0481 J	0.197 J+	0.0928	0.0724
Benzene	5.6	0.00698	0.00514 J+	0.00183 J	0.00179 J
Carbon disulfide	3,000	0.00351 J	0.00203 J+	0.00103 J	0.000975 J
Ethylbenzene	29	0.00268	0.00359 J+	0.00174 J	0.00109 J
Isopropylbenzene	11,000	0.00106 J	0.00194 U	0.00197 U	0.00217 U
Naphthalene	20	0.00481 U	0.285 U	0.239 UJ	0.155 J-
n-Butylbenzene	NE	0.00192 U	0.114 U	0.0957 U	0.00217 U
n-Propylbenzene	NE	0.00192 U	0.114 U	0.0957 U	0.00217 U
sec-Butylbenzene	NE	0.000879 J	0.114 U	0.0957 U	0.00217 U
Tetrachloroethene	2.7	0.0105	0.00482 J+	0.00197 UJ	0.0557 J-
Toluene	46,000	0.0145	0.0338 J+	0.00197 U	0.00217 U
Trichloroethene	14	0.00198 U	0.00194 U	0.00197 UJ	0.00217 U
Xylenes, total	2,600	0.0205	0.0209 J+	0.0108	0.00403 J
Polycyclic Aromatic Hydrocarbons (mg/kg)					
Benzo (a) anthracene	2.1	0.0828 U	0.0809 U	0.809 U	0.200
Benzo (a) pyrene	0.21	0.0828 U	0.0809 U	**0.809 U**	**0.366**
Benzo (b) fluoranthene	2.1	0.0828 U	0.0809 U	0.809 U	0.313
Benzo (g,h,i) perylene	NE	0.0828 U	0.0809 U	0.809 U	0.297
Benzo (k) fluoranthene	21	0.0828 U	0.0809 U	0.809 U	0.250
Chrysene	210	0.0828 U	0.0809 U	0.809 U	0.206
Dibenz (a,h) anthracene	0.21	0.0828 U	0.0809 U	**0.809 U**	0.0978
Fluoranthene	22,000	0.0828 U	0.0410 J	0.809 U	0.219
Indeno (1,2,3-cd) pyrene	2.1	0.0828 U	0.0809 U	0.809 U	0.271
Phenanthrene	NE	0.0828 U	0.0809 U	0.809 U	0.0945
Pyrene	17,000	0.0828 U	0.0809 U	0.809 U	0.258
RCRA Metals (mg/kg)					
Arsenic	1.6	**15.7 J+**	**10.7 J+**	**13.6 J+**	**17.4 J+**
Barium	190,000	622 J+	346 J+	247 J+	392 J+
Cadmium	810	1.26 U	1.19 U	1.20 U	12.4 U
Chromium	1,400	26.1 J+	20.1 J+	22.1 J+	34.8 J+
Lead	800	23.1	75.3	37.7	65.1
Mercury	28	0.0915 J	0.125	0.201	0.282
Selenium	5,100	2.49 J+	3.08 J+	2.82 J+	24.8 U

TABLE 3
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FEBRUARY 2009 ANALYTICAL RESULTS FOR SOIL SAMPLES

Analyte	EPA Regional Screening Levels Industrial Soil	TWR-10-0-5	TWR-12-5-10	TWR-13-5-10	TWR-14-5-10
Volatile Organic Compounds (mg/kg)					
1,2,4-Trimethylbenzene	280	0.00267	0.0122	0.0216	0.00924
1,3,5-Trimethylbenzene	200	0.00204 U	0.00605	0.0107	0.00460
2-Butanone	190,000	0.0510 U	0.0503 U	0.0567 U	0.0498 U
4-Methyl-2-pentanone	52,000	0.0510 U	0.0503 U	0.0567 U	0.0498 U
Acetone	610,000	0.0700	0.0360 J	0.0332 J	0.0304 J
Benzene	5.6	0.00592	0.00636	0.00829	0.00951
Carbon disulfide	3,000	0.00228 J	0.00309 J	0.00345 J	0.00260 J
Ethylbenzene	29	0.00150 J	0.00320	0.00523	0.00434
Isopropylbenzene	11,000	0.00204 U	0.00201 U	0.00227 U	0.00199 U
Naphthalene	20	0.00341 J	0.00232 J	0.00243 J	0.00169 J
n-Butylbenzene	NE	0.00204 U	0.00201 U	0.000964 J	0.00199 U
n-Propylbenzene	NE	0.00204 U	0.000875 J	0.00132 J	0.000896 J
sec-Butylbenzene	NE	0.00204 U	0.00201 U	0.00227 U	0.00199 U
Tetrachloroethene	2.7	**7.25**	0.0306	0.0498	0.0662
Toluene	46,000	0.00302	0.0117	0.0187	0.0162
Trichloroethene	14	0.00204 U	0.00201 U	0.00227 U	0.00199 U
Xylenes, total	2,600	0.00600	0.0246	0.0376	0.0223
Polycyclic Aromatic Hydrocarbons (mg/kg)					
Benzo (a) anthracene	2.1	0.0813 U	0.0852 U	0.0850 U	0.0865 U
Benzo (a) pyrene	0.21	0.0813 U	0.0852 U	0.0850 U	0.0865 U
Benzo (b) fluoranthene	2.1	0.0813 U	0.0852 U	0.0850 U	0.0865 U
Benzo (g,h,i) perylene	NE	0.0813 U	0.0852 U	0.0850 U	0.0865 U
Benzo (k) fluoranthene	21	0.0813 U	0.0852 U	0.0850 U	0.0865 U
Chrysene	210	0.0813 U	0.0852 U	0.0850 U	0.0865 U
Dibenz (a,h) anthracene	0.21	0.0813 U	0.0852 U	0.0850 U	0.0865 U
Fluoranthene	22,000	0.0489 J	0.0852 U	0.0850 U	0.0865 U
Indeno (1,2,3-cd) pyrene	2.1	0.0813 U	0.0852 U	0.0850 U	0.0865 U
Phenanthrene	NE	0.0813 U	0.0852 U	0.0850 U	0.0865 U
Pyrene	17,000	0.0813 U	0.0852 U	0.0850 U	0.0865 U
RCRA Metals (mg/kg)					
Arsenic	1.6	**9.91 J+**	**20.3 J+**	**35.7 J+**	**26.0 J+**
Barium	190,000	282 J+	412 J+	565 J+	393 J+
Cadmium	810	1.24 U	1.24 J	1.28 J	1.53 J
Chromium	1,400	28.6 J+	33.9 J+	41.4 J+	44.1 J+
Lead	800	29.1	30.2	29.8	20.1
Mercury	28	0.137	0.124 U	0.0883 J	0.129 U
Selenium	5,100	2.83 J+	24.7 U	25.7 U	25.5 U

TABLE 3
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FEBRUARY 2009 ANALYTICAL RESULTS FOR SOIL SAMPLES

Analyte	EPA Regional Screening Levels Industrial Soil	TWR-15-5-10	TWR-16-5-10	TWR-17-5-10	TWR-18-5-10
Volatile Organic Compounds (mg/kg)					
1,2,4-Trimethylbenzene	280	0.00673	0.00238	0.00540	0.00676
1,3,5-Trimethylbenzene	200	0.00319	0.00113 J	0.00242	0.00348
2-Butanone	190,000	0.0449 U	0.0467 U	0.0476 U	0.00894 J
4-Methyl-2-pentanone	52,000	0.0449 U	0.0467 U	0.0476 U	0.0477 U
Acetone	610,000	0.0449 U	0.0310 J	0.0293 J	0.0800
Benzene	5.6	0.0108	0.00619	0.0114	0.00450
Carbon disulfide	3,000	0.00313 J	0.00221 J	0.00333 J	0.00243 J
Ethylbenzene	29	0.00354	0.00128 J	0.00372	0.00170 J
Isopropylbenzene	11,000	0.00180 U	0.00187 U	0.00190 U	0.00191 U
Naphthalene	20	0.00449 U	0.00467 U	0.00476 U	0.00477 U
n-Butylbenzene	NE	0.00180 U	0.00187 U	0.00190 U	0.00191 U
n-Propylbenzene	NE	0.00180 U	0.00187 U	0.00190 U	0.00191 U
sec-Butylbenzene	NE	0.00180 U	0.00187 U	0.00190 U	0.00191 U
Tetrachloroethene	2.7	0.00648	0.119	0.00162 J	0.00191 U
Toluene	46,000	0.0156	0.00349	0.0159	0.0102
Trichloroethene	14	0.00180 U	0.000952 J	0.00190 U	0.00191 U
Xylenes, total	2,600	0.0181	0.00592	0.0153	0.0149
Polycyclic Aromatic Hydrocarbons (mg/kg)					
Benzo (a) anthracene	2.1	0.0801 U	0.0612 J	0.0827 U	0.0855 U
Benzo (a) pyrene	0.21	0.0801 U	0.0750 J	0.0827 U	0.0855 U
Benzo (b) fluoranthene	2.1	0.0801 U	0.0922	0.0827 U	0.0855 U
Benzo (g,h,i) perylene	NE	0.0801 U	0.0557 J	0.0827 U	0.0855 U
Benzo (k) fluoranthene	21	0.0801 U	0.0530 J	0.0827 U	0.0855 U
Chrysene	210	0.0801 U	0.0734 J	0.0827 U	0.0855 U
Dibenz (a,h) anthracene	0.21	0.0801 U	0.0789 U	0.0827 U	0.0855 U
Fluoranthene	22,000	0.0801 U	0.107	0.0827 U	0.0855 U
Indeno (1,2,3-cd) pyrene	2.1	0.0801 U	0.0534 J	0.0827 U	0.0855 U
Phenanthrene	NE	0.0801 U	0.0789 U	0.0827 U	0.0855 U
Pyrene	17,000	0.0801 U	0.111	0.0827 U	0.0855 U
RCRA Metals (mg/kg)					
Arsenic	1.6	**9.16 J+**	**10.9 J+**	**9.74 J+**	**12.6 U**
Barium	190,000	266 J+	265 J+	219 J+	294 J+
Cadmium	810	1.23 U	0.669 J	1.25 U	12.6 U
Chromium	1,400	24.8 J+	29.6 J+	26.6 J+	12.1 J+
Lead	800	20.4	55.2	15.3	216
Mercury	28	0.121 U	0.181	0.122 U	0.136
Selenium	5,100	2.96 J+	3.85 J+	3.20 J+	25.2 U

TABLE 3
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FEBRUARY 2009 ANALYTICAL RESULTS FOR SOIL SAMPLES

Analyte	EPA Regional Screening Levels Industrial Soil	Duplicate* TWR-21-5-10	TWR-19-5-10	TWR-20-5-10
Volatile Organic Compounds (mg/kg)				
1,2,4-Trimethylbenzene	280	0.0119	0.00639	0.0101
1,3,5-Trimethylbenzene	200	0.00589	0.00307	0.00434
2-Butanone	190,000	0.0554 U	0.0501 U	0.0457 U
4-Methyl-2-pentanone	52,000	0.0554 U	0.0501 U	0.0457 U
Acetone	610,000	0.0535 J	0.0310 J	0.0457 U
Benzene	5.6	0.00599	0.00264	0.00958
Carbon disulfide	3,000	0.00337 J	0.00125 J	0.00459
Ethylbenzene	29	0.00257	0.00128 J	0.00254
Isopropylbenzene	11,000	0.00222 U	0.00201 U	0.00183 U
Naphthalene	20	0.00554 U	0.00501 U	0.00147 J
n-Butylbenzene	NE	0.00222 U	0.00201 U	0.00183 U
n-Propylbenzene	NE	0.00222 U	0.00201 U	0.00183 U
sec-Butylbenzene	NE	0.00222 U	0.00201 U	0.00183 U
Tetrachloroethene	2.7	0.00222 U	0.00116 J	0.00317 J-
Toluene	46,000	0.0153	0.00715	0.0159
Trichloroethene	14	0.00222 U	0.00201 U	0.00183 U
Xylenes, total	2,600	0.0238	0.0118	0.0201
Polycyclic Aromatic Hydrocarbons (mg/kg)				
Benzo (a) anthracene	2.1	0.0918 U	0.0863 U	0.0787 U
Benzo (a) pyrene	0.21	0.0918 U	0.0863 U	0.0787 U
Benzo (b) fluoranthene	2.1	0.0918 U	0.0863 U	0.0787 U
Benzo (g,h,i) perylene	NE	0.0918 U	0.0863 U	0.0787 U
Benzo (k) fluoranthene	21	0.0918 U	0.0863 U	0.0787 U
Chrysene	210	0.0918 U	0.0863 U	0.0787 U
Dibenz (a,h) anthracene	0.21	0.0918 U	0.0863 U	0.0787 U
Fluoranthene	22,000	0.0918 U	0.0863 U	0.0787 U
Indeno (1,2,3-cd) pyrene	2.1	0.0918 U	0.0863 U	0.0787 U
Phenanthrene	NE	0.0918 U	0.0863 U	0.0787 U
Pyrene	17,000	0.0918 U	0.0863 U	0.0787 U
RCRA Metals (mg/kg)				
Arsenic	1.6	**41.6 J+**	**19.3 J+**	**34.6 J+**
Barium	190,000	1000 J+	2530 J+	1220 J+
Cadmium	810	1.92 J	1.82 J	1.64 J
Chromium	1,400	49.0 J+	47.4 J+	37.9 J+
Lead	800	18.9	15.9	11.2 J
Mercury	28	0.0919 J	0.131 U	0.0824 J
Selenium	5,100	27.4 U	26.1 U	23.4 U

TABLE 3
PHASE II ENVIRONMENTAL SITE ASSESSMENT
FEBRUARY 2009 ANALYTICAL RESULTS FOR SOIL SAMPLES

Notes:

*	Sample TWR-21-5-10 is a duplicate of sample TWR-18-5-10
EPA	U.S. Environmental Protection Agency
J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and possibly biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and possibly biased low.
mg/kg	Milligrams per kilogram
NE	Not established
RCRA	Resource Conservation and Recovery Act
TWR	Tennessee Wheel and Rubber TBA
U	The analyte was analyzed for, but was not detected at or above the associated value.
	The result was non detect; however, the reporting limit exceeded the EPA April 2009 Regional Screening Value.
BOLD	The result was detected above the EPA April 2009 Regional Screening Value.

TABLE 4
PHASE II ENVIRONMENTAL SITE ASSESSMENT
JULY 2009 MEMBRANE INTERFACE PROBE INVESTIGATION
ANALYTICAL RESULTS FOR CONFIRMATION SOIL SAMPLES

Analyte	EPA Regional Screening Levels Industrial Soil	MIP-1-5-10	MIP-DUP	MIP-2-2-7	MIP-4-2-7	MIP-6-3-8	MIP-7-4-9
Volatile Organic Compounds (mg/kg)							
1,2,4-Trimethylbenzene	280	0.00831	0.00767	0.00258	0.00916	0.00866	0.00770
1,3,5-Trimethylbenzene	200	0.00386	0.00357	0.00122 J	0.00439	0.00434	0.00363
Acetone	610,000	0.0470 U	0.0415 U	0.0446 U	0.0432 U	0.0515 U	0.0497 U
Benzene	5.6	0.00501	0.00438	0.00487	0.00543	0.00573	0.00594
Carbon disulfide	3,000	0.00355 J	0.00236 J	0.00289 J	0.00305 J	0.00428 J	0.00389 J
cis-1,2-Dichloroethene	10,000	0.00188 U	0.00166 U	0.00178 U	0.00173 U	0.00206 U	0.00199 U
Ethylbenzene	29	0.00221	0.00187	0.00173 J	0.00244	0.00288	0.00270
n-Propylbenzene	NE	0.00188 U	0.00166 U	0.00178 U	0.00173 U	0.00206 U	0.00199 U
Tetrachloroethene	2.7	0.165	0.146	0.981	0.662	0.614	0.0123
Toluene	46,000	0.0120	0.0105	0.00868	0.0130	0.0143	0.0144
trans-1,2-Dichloroethene	500	0.00188 U	0.00166 U	0.00178 U	0.00173 U	0.00206 U	0.00199 U
Trichloroethene	14	0.00188 U	0.00166 U	0.00178 U	0.00173 U	0.00206 U	0.00199 U
Xylenes, total	2,600	0.0163	0.0150	0.00731	0.0174	0.0185	0.0177

TABLE 4
PHASE II ENVIRONMENTAL SITE ASSESSMENT
JULY 2009 MEMBRANE INTERFACE PROBE INVESTIGATION
ANALYTICAL RESULTS FOR CONFIRMATION SOIL SAMPLES

Analyte	EPA Regional Screening Levels Industrial Soil	MIP-10-2-7	MIP-11-6-11	MIP-14-1-6	MIP-15-2-7	MIP-16-5-10
Volatile Organic Compounds (mg/kg)						
1,2,4-Trimethylbenzene	280	0.00453	0.00980	0.00160 J	0.00280	0.0102
1,3,5-Trimethylbenzene	200	0.00208	0.00465	0.000808 J	0.00129 J	0.00463
Acetone	610,000	0.0443 U	0.0515 U	0.0302 J	0.0442 U	0.0463 U
Benzene	5.6	0.00560	0.00570	0.00345	0.00622	0.00806
Carbon disulfide	3,000	0.00234 J	0.00374 J	0.00138 J	0.00256 J	0.00311 J
cis-1,2-Dichloroethene	10,000	0.00177 U	0.00148 J	0.142	0.00177 U	0.00185 U
Ethylbenzene	29	0.00248	0.00277	0.000709 J	0.00182	0.00344
n-Propylbenzene	NE	0.00177 U	0.00206 U	0.00197 U	0.00177 U	0.000666 J
Tetrachloroethene	2.7	0.117	0.0582	**116**	0.0534	0.0204
Toluene	46,000	0.0116	0.0151	0.00554	0.0102	0.0172
trans-1,2-Dichloroethene	500	0.00177 U	0.00206 U	0.00859	0.00177 U	0.00185 U
Trichloroethene	14	0.00177 U	0.00206 U	0.103	0.00177 U	0.00185 U
Xylenes, total	2,600	0.0112	0.0195	0.00366 J	0.00799	0.0215

TABLE 4
PHASE II ENVIRONMENTAL SITE ASSESSMENT
JULY 2009 MEMBRANE INTERFACE PROBE INVESTIGATION
ANALYTICAL RESULTS FOR CONFIRMATION SOIL SAMPLES

Notes:

DUP	Field Duplicate
EPA	U.S. Environmental Protection Agency
J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
mg/kg	Milligrams per kilogram
NL	Not listed
MIP	Membrane interface probe
U	The analyte was analyzed for, but was not detected at or above the associated value.
BOLD	The result was detected above the screening value.

TABLE 5
PHASE II ENVIRONMENTAL SITE ASSESSMENT
MEMBRANE INTERPHASE PROBE BORINGS
AND
PCE CONCENTRATIONS IN CONFIRMATION SOIL SAMPLES

Boring Number	Confirmation Sample ID	Sample Depth (feet)	ECD Response (mV)	Laboratory Analysis	PCE Concentration (mg/kg)
MIP-1	MIP-1-5-10	5 to 10	>1.40E+07	Yes	0.165
MIP-2	MIP-2-2-7	2 to 7	>1.40E+07	Yes	0.981
MIP-3	NS	NA	>1.40E+07	No	NA
MIP-4	MIP-4-2-7	2 to 7	>1.40E+07	Yes	0.662
MIP-5	NS	NA	>1.40E+07	No	NA
MIP-6	MIP-6-3-8	3 to 8	>1.40E+07	Yes	0.614
MIP-7	MIP-7-4-9	4 to 9	>1.20E+07	Yes	0.0123
MIP-8	NS	NA	>1.40E+07	No	NA
MIP-9	NS	NA	6.0E+ 06	No	NA
MIP-10	MIP-10-2-7	2 to 7	>1.40E+07	Yes	0.117
MIP-11	MIP-11-6-11	6 to 11	>3.50E+06	Yes	0.0582
MIP-12	NS	NA	>1.40E+07	No	NA
MIP-13	NS	NA	>1.40E+07	No	NA
MIP-14	MIP-14-1-6	1 to 6	>1.40E+07	Yes	116
MIP-15	MIP-15-2-7	2 to 7	>5.00E+06	Yes	0.0534
MIP-16	MIP-16-5-10	5 to 10	>2.00E+06	Yes	0.0204

Notes:

>	=	Greater than
E	=	Exponent
ECD	=	Electron capture detector
ID	=	Identification
mg/kg	=	Milligram per kilogram
MIP	=	Membrane Interface Probe
NA	=	Not applicable
NS	=	Not sampled
PCE	=	Tetrachloroethylene

APPENDIX C

PHOTOGRAPHIC LOG

(28 Pages)

OFFICIAL PHOTOGRAPH NO. 1
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	West	**Date:**	February 25, 2009
Photographer:	Tim Ward, Tetra Tech	**Witness:**	John Galler, Tetra Tech

Subject: An excavated location in the area of the suspected underground storage tank (UST) located on the northern portion of the property.

OFFICIAL PHOTOGRAPH NO. 2
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-003-0052

Location: Tennessee Wheel and Rubber TBA

Orientation: North

Date: February 25, 2009

Photographer: Tim Ward, Tetra Tech

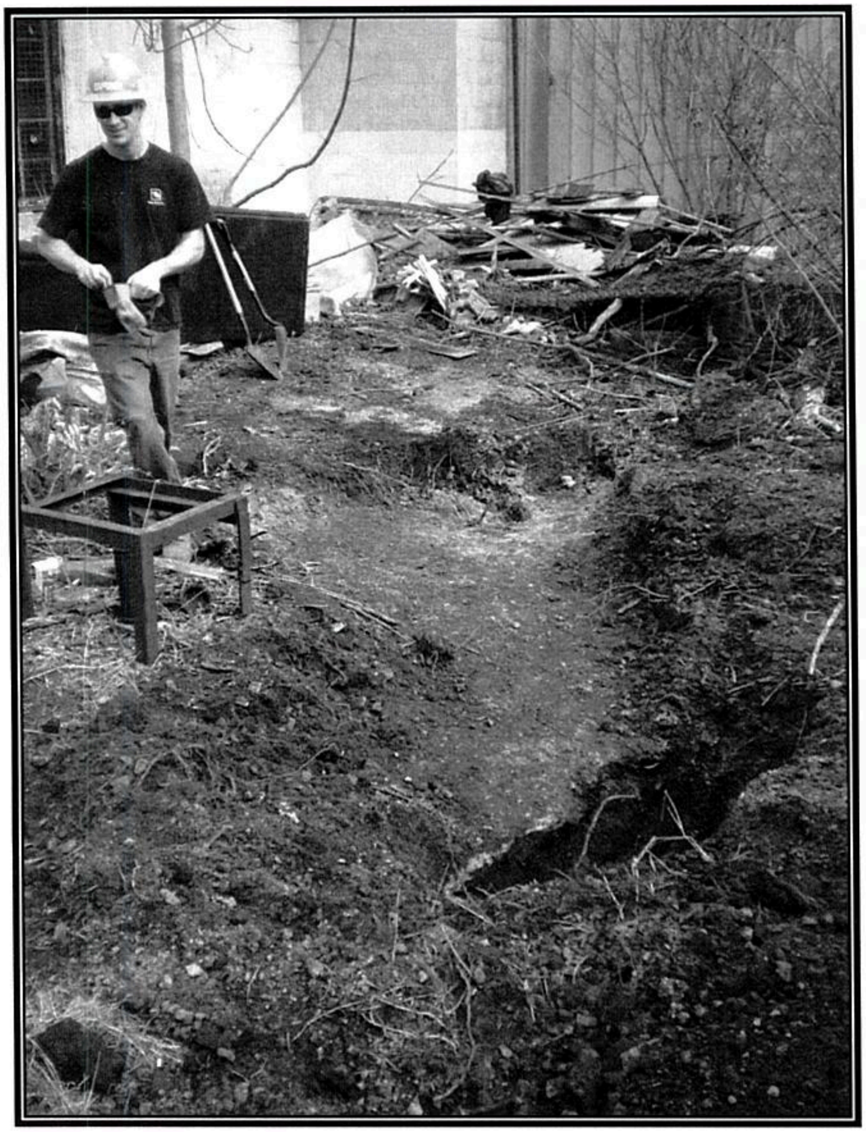
Witness: John Galler, Tetra Tech

Subject: A partially buried concrete slab at the northern suspected UST location. This slab is believed to be covering the top of a UST. The slab was uncovered approximately 2-3 feet below ground surface.

OFFICIAL PHOTOGRAPH NO. 3
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	West	**Date:**	February 25, 2009
Photographer:	Tim Ward, Tetra Tech	**Witness:**	John Galler, Tetra Tech

Subject: The UST fill pipe in relation to the buried concrete slab at the northern suspected UST location.



OFFICIAL PHOTOGRAPH NO. 4
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	East	**Date:**	February 25, 2009
Photographer:	Tim Ward, Tetra Tech	**Witness:**	John Galler, Tetra Tech

Subject: A partially buried concrete slab at the southern suspected UST location. This slab is believed to be covering the top of the UST. The slab was uncovered approximately 2 feet below ground surface.

OFFICIAL PHOTOGRAPH NO. 5
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-003-0052 **Location:** Tennessee Wheel and Rubber TBA

Orientation: Northwest **Date:** February 25, 2009

Photographer: Tim Ward, Tetra Tech **Witness:** John Galler, Tetra Tech

Subject: The UST fill pipe in relation to the buried concrete slab at the southern suspected UST location.

OFFICIAL PHOTOGRAPH NO. 6
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	West	**Date:**	February 25, 2009
Photographer:	Tim Ward, Tetra Tech	**Witness:**	John Galler, Tetra Tech

Subject: A suspected product transport line or vent pipeline at the southern suspected UST location. This feature was uncovered and appears to be routed beneath the slab mentioned previously.

OFFICIAL PHOTOGRAPH NO. 7
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-003-0052 **Location:** Tennessee Wheel and Rubber TBA

Orientation: West **Date:** July 8, 2009

Photographer: James Caruthers, Tetra Tech **Witness:** Tim Ward, Tetra Tech

Subject: Illegal dumping on site hindering access to drilling locations

OFFICIAL PHOTOGRAPH NO. 8
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	Northwest	**Date:**	July 8, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Tim Ward, Tetra Tech

Subject: Illegal dumping on site hindering access to drilling locations. Debris in doorway

OFFICIAL PHOTOGRAPH NO. 9
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	East	**Date:**	July 8, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Tim Ward, Tetra Tech
Subject:	Illegal dumping on site hindering access to drilling locations. Debris in doorway		

OFFICIAL PHOTOGRAPH NO. 10
U.S. ENVIRONMENTAL PROTECTION AGENCY

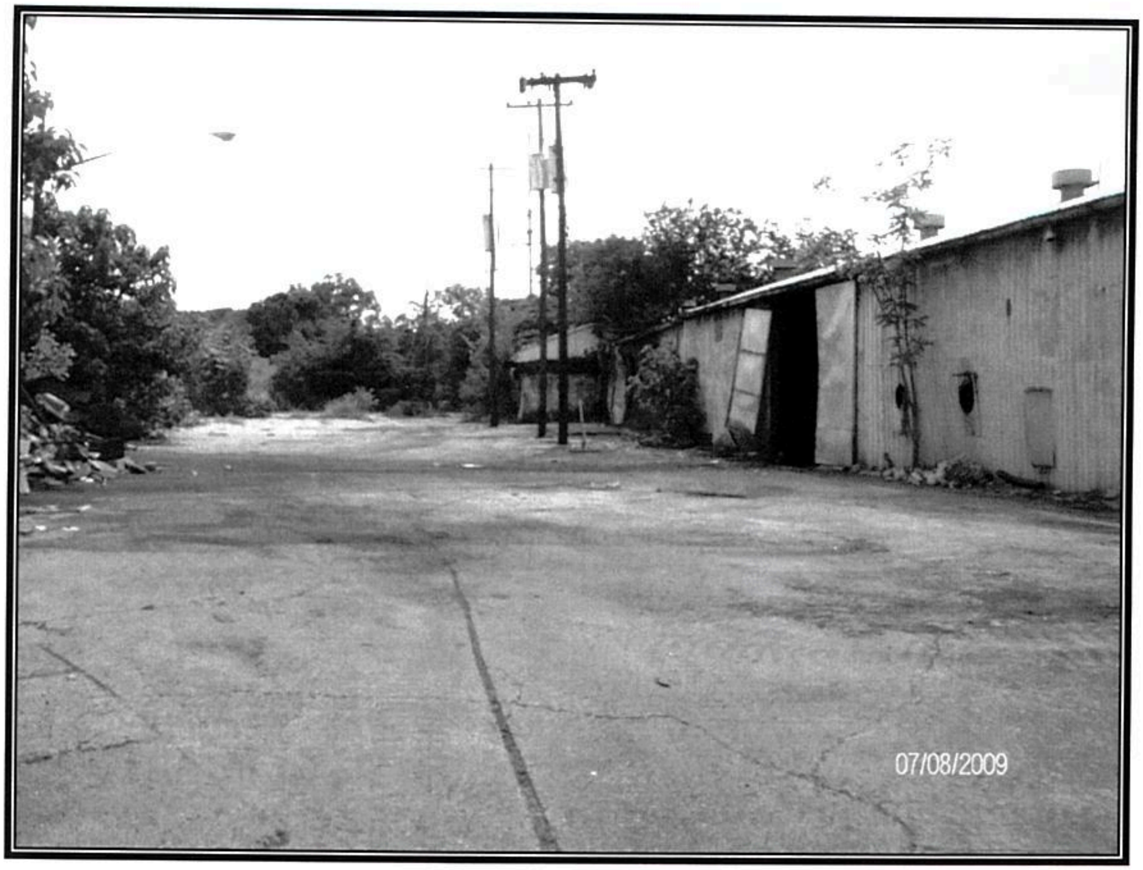
TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	East	**Date:**	July 8, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Tim Ward, Tetra Tech
Subject:	Clearing and stock piling debris		

OFFICIAL PHOTOGRAPH NO. 11
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	South	**Date:**	July 8, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Tim Ward, Tetra Tech
Subject:	Area after debris clean up		

OFFICIAL PHOTOGRAPH NO. 12
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	South	**Date:**	July 8, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Tim Ward, Tetra Tech
Subject:	Area to be investigated after debris clean up		

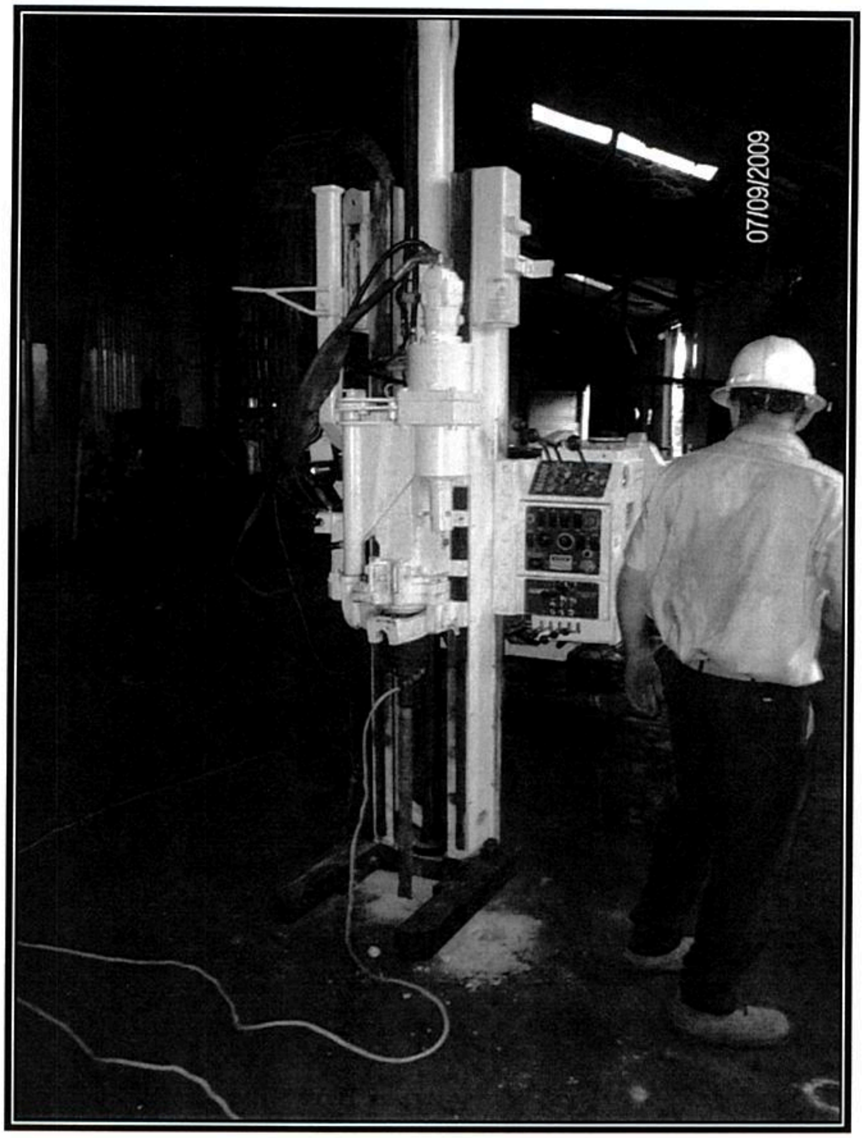


OFFICIAL PHOTOGRAPH NO. 13
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	Southwest	**Date:**	July 8, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Tim Ward, Tetra Tech
Subject:	Area after debris clean up with debris pile to the left		

OFFICIAL PHOTOGRAPH NO. 14
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	South	**Date:**	July 8, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Tim Ward, Tetra Tech
Subject:	Debris pile		

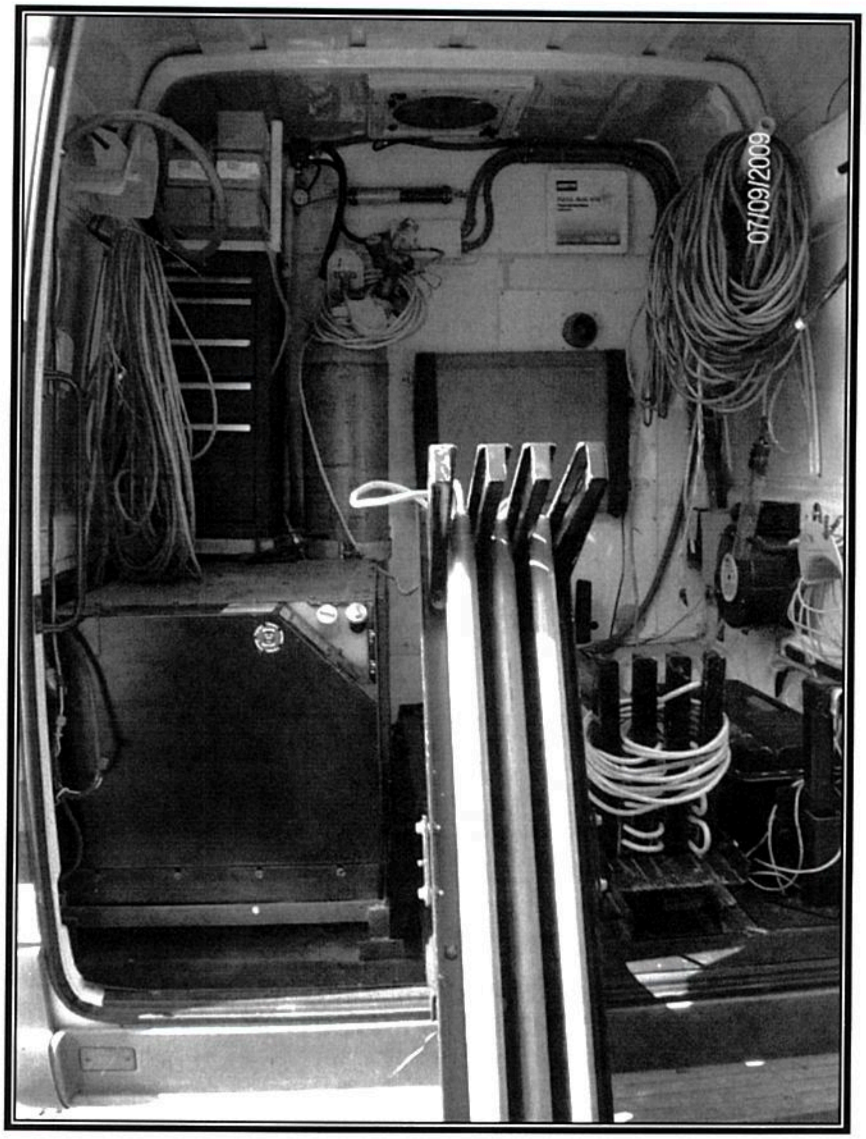


OFFICIAL PHOTOGRAPH NO. 15
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	Northeast	**Date:**	July 9, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Chuck Terry, Vironex
Subject:	MIP rig set up on Boring MIP-1		

OFFICIAL PHOTOGRAPH NO. 16
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	Southwest	**Date:**	July 9, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Chuck Terry, Vironex
Subject:	MIP van and drill rods		



OFFICIAL PHOTOGRAPH NO. 17
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	South	**Date:**	July 9, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Chuck Terry, Vironex
Subject:	Inside back of MIP van		

OFFICIAL PHOTOGRAPH NO. 18
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	East	**Date:**	July 9, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Chuck Terry, Vironex
Subject:	Chuck Terry of Vironex inside MIP van with data recording equipment		

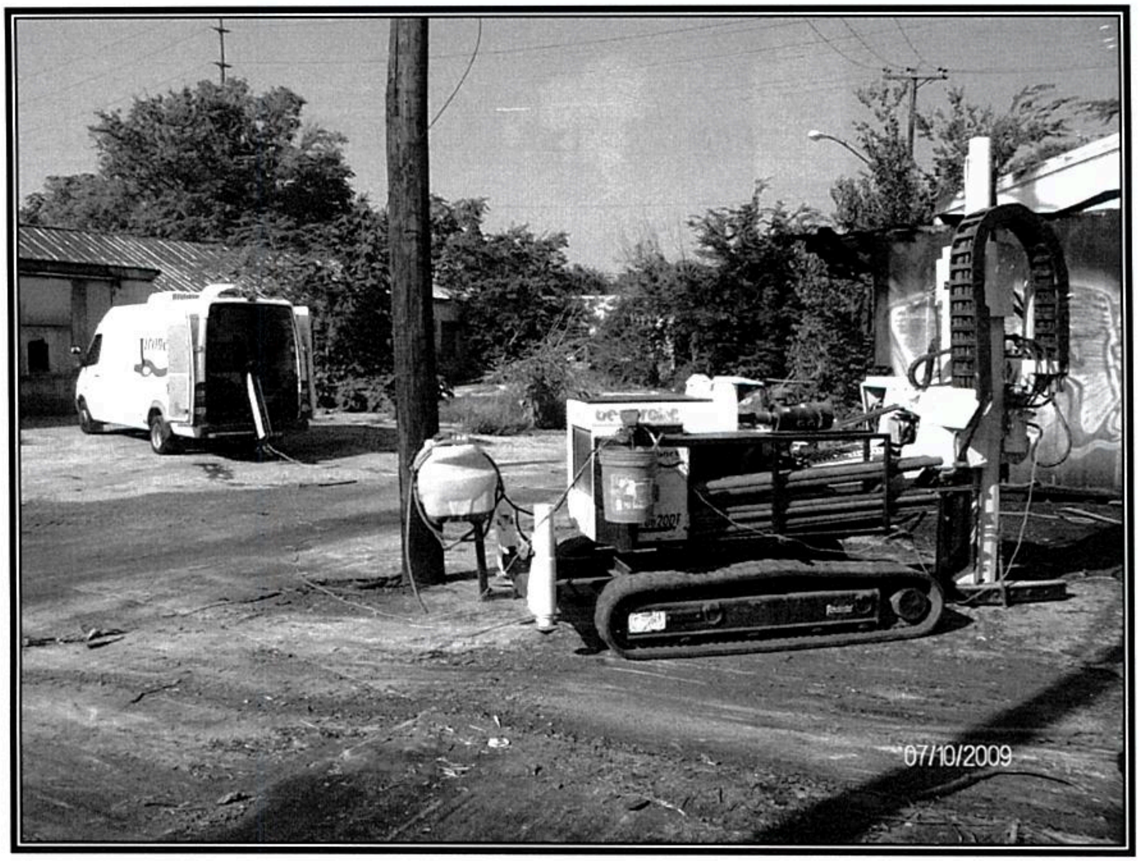
OFFICIAL PHOTOGRAPH NO. 19
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number: TTEMI-05-003-0052 **Location:** Tennessee Wheel and Rubber TBA

Orientation: South **Date:** July 9, 2009

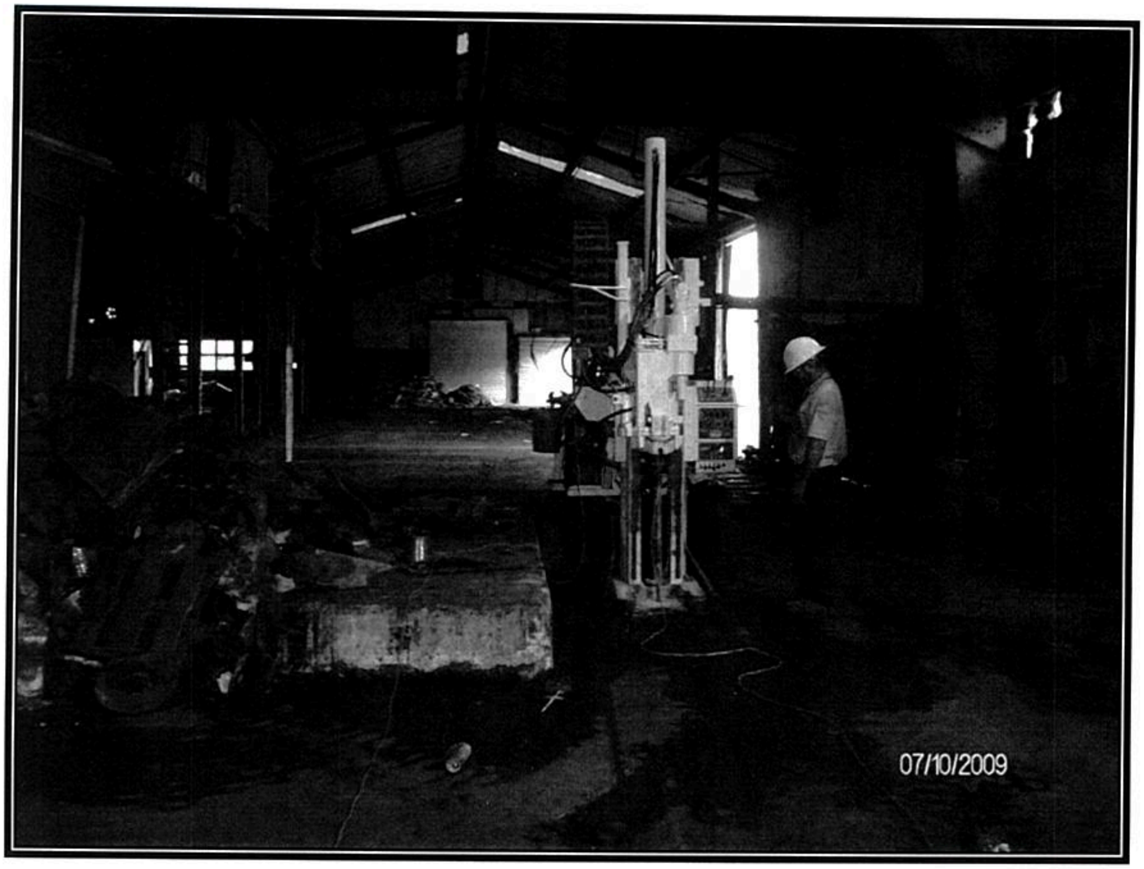
Photographer: James Caruthers, Tetra Tech **Witness:** Chuck Terry, Vironex

Subject: MIP rig and van on boring MIP-5



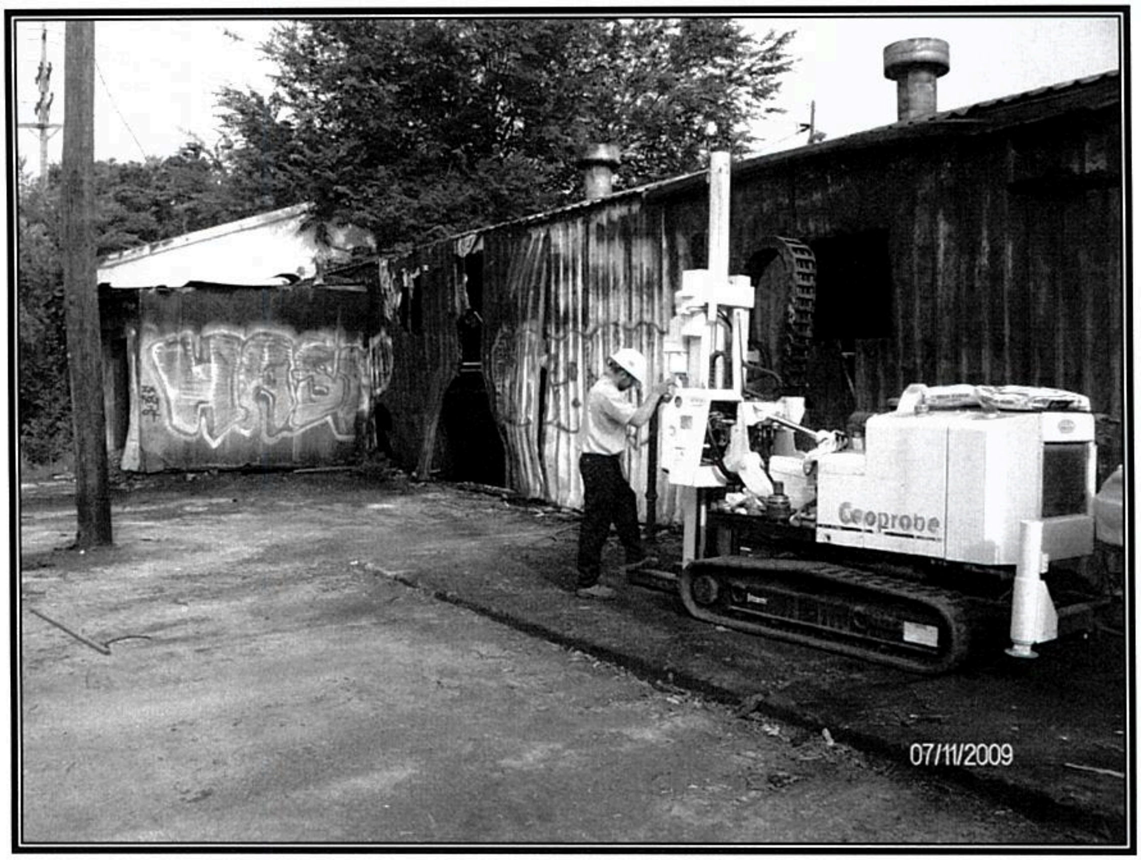
OFFICIAL PHOTOGRAPH NO. 20
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	South	**Date:**	July 10, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Chuck Terry, Vironex
Subject:	MIP rig and van on boring MIP-12		



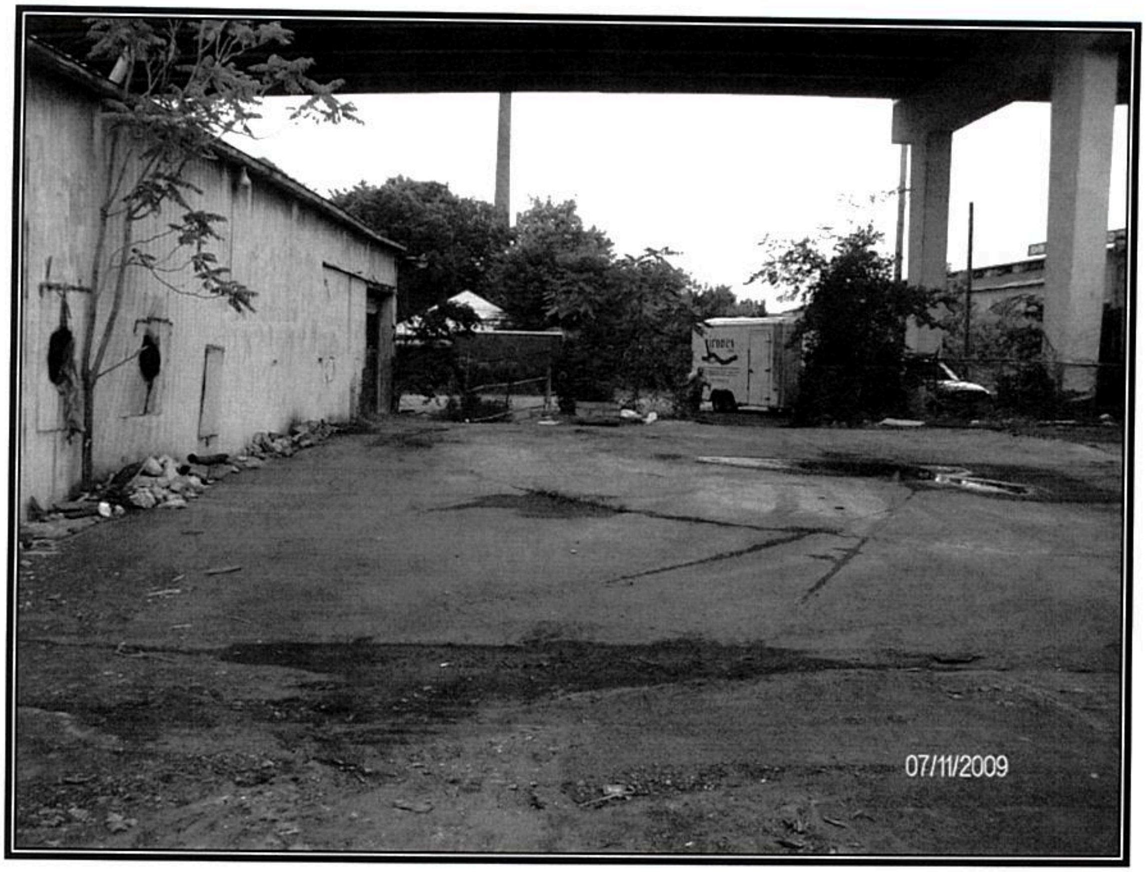
OFFICIAL PHOTOGRAPH NO. 21
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	Northeast	**Date:**	July 10, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Chuck Terry, Vironex
Subject:	MIP rig on boring MIP-15		



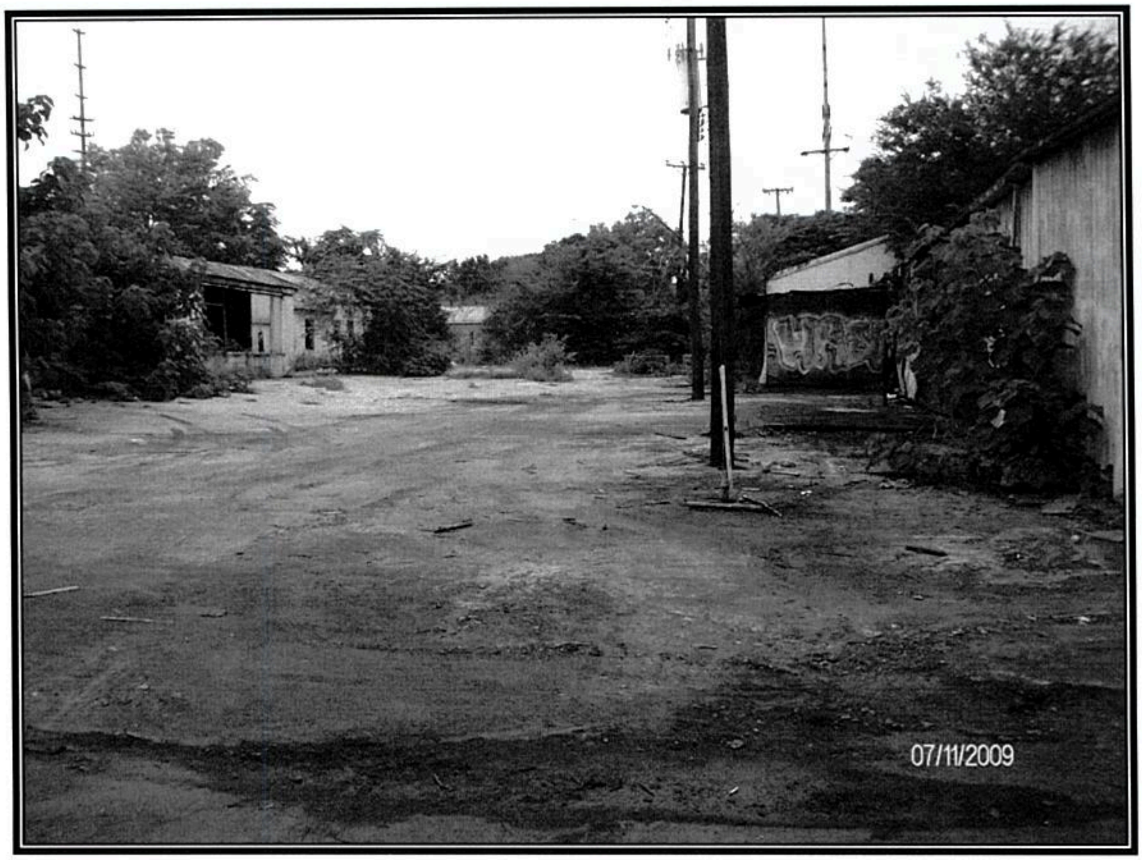
OFFICIAL PHOTOGRAPH NO. 22
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	West	**Date:**	July 11, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Cory Gamwell, Vironex
Subject:	Conducting confirmation sampling		



OFFICIAL PHOTOGRAPH NO. 23
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	Northeast	**Date:**	July 11, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Cory Gamwell, Vironex
Subject:	Site as left after MIP investigation		



OFFICIAL PHOTOGRAPH NO. 24
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	Southwest	**Date:**	July 11, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Cory Gamwell, Vironex
Subject:	Site as left after MIP investigation		

OFFICIAL PHOTOGRAPH NO. 25
U.S. ENVIRONMENTAL PROTECTION AGENCY

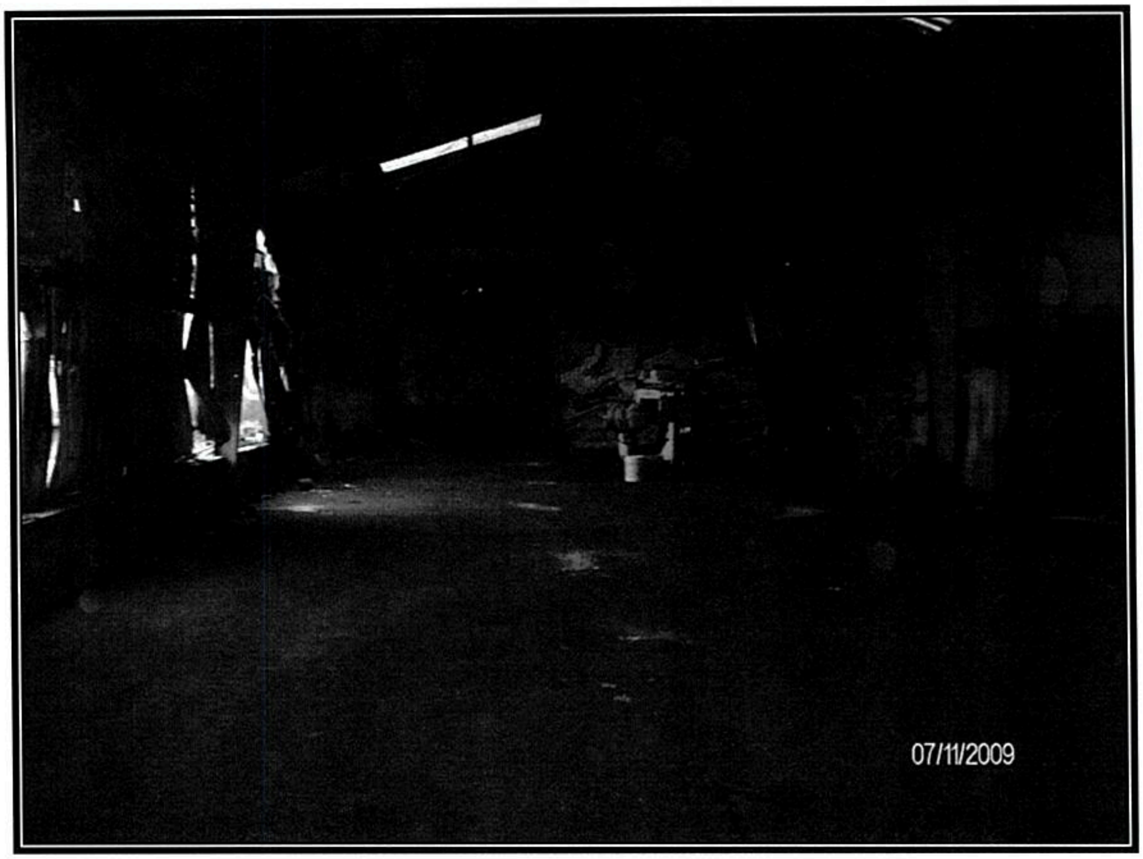
TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	South	**Date:**	July 11, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Cory Gamwell, Vironex
Subject:	Debris pile as left after MIP investigation		

OFFICIAL PHOTOGRAPH NO. 26
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	North	**Date:**	July 11, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Cory Gamwell, Vironex
Subject:	Site as left after MIP investigation		

OFFICIAL PHOTOGRAPH NO. 27
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	West	**Date:**	July 11, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Cory Gamwell, Vironex
Subject:	Site as left after MIP investigation		



OFFICIAL PHOTOGRAPH NO. 28
U.S. ENVIRONMENTAL PROTECTION AGENCY

TDD Number:	TTEMI-05-003-0052	**Location:**	Tennessee Wheel and Rubber TBA
Orientation:	West	**Date:**	July 11, 2009
Photographer:	James Caruthers, Tetra Tech	**Witness:**	Cory Gamwell, Vironex
Subject:	Site as left after MIP investigation		

APPENDIX D

FIELD LOGBOOK NOTES

(14 Pages)

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	MIKE NORMAN	
	CAMERON SIMPSON	
	PAULA LARSON	
	JOHN HOFFELT	
	ANDY ~~CHSVETZ~~ SHIVAS, BROWNFIELDS	

00157

LEGAL DOCUMENT
DO NOT DESTROY

1400 ARRIVE TWR

PHASE 1 – STRAIGHT-FORWARD

STATE TO CLEAN-UP AND SELL

NEED NEW ACCESS AGREEMENT

METRO WAS TRYING TO SELL FOR BACK TAXES

LOOKING FOR FULL DISCLOSURE FOR SELL

1410 ANDY SHIJAS ARRIVES

DR. JOE MORRIS AND A LOCAL (MEC)

WANTS TO PURCHASE

1422 PHASE I – QUICK

* 6 MONTHS FOR PHASE II (METRO/ANDY/MIKE)

1428 BEGIN TOUR

TWR HAS BEEN VANDALIZED OR CLEANED-OUT

1457 MR. RAMSEY MAY BE WILLING TO HELP

OTHERWISE, MAY HAVE TO BIAS SAMPLE AND

PICK OTHER LOCATIONS

1534 DR. GALLER RECOMMENDS EM PRIOR TO PHASE II

MR. NOCRANY AGREES

USING BROWN.

SCHEDULE

PHASE 1 w/ FULL EDR, ETC.

— INTERVIEWS WOULD HELP (RAMSEY)

— COULD ASK SOME LOCALS

— 3 WEEKS

USE NEW PRGs

EM 6/4 THANKSGIVING

PHASE II AFTER TANKS DELINEATED

— USE ON PADS IN COURTYARD

NEED GW : 4 SOIL NEXT TO USTS

NEED GW FROM EACH CORNER

— WELLS TO REFUSAL OR GW OR 30'

→ PHASE II 0-3" ON SOIL

— THEN ON CONCRETE

1) CORE 2) DRILL a) SURFACE b) <18"

— GET TO SOIL BELOW FILL GRAVEL

2/2 1300 Hoelene Company (Whitney + Charlie) and Tetra Tech (Jim Galli) on-site Conduct safety talk and review work areas + associated hazards.

1315 Begin clearing NE Corner of site (Area 1)

1355 Area 1 is cleared. conducting final site prep (blowing) for EM Work

1405 move to Area #2 on SE corner of property. Begin clearing area 2.

2/5/09

1100 Tetra Tech (Ward + Galli) onsite, review safety plan. Begin set-up at NE UST Area.

1130 Complete layout for EM survey at NE UST. Continue to Central portion of site.

1135 Move to SW UST Area for set up.

1155 Complete set up activities. Break for lunch.

1230 return from lunch.

1245 begin survey activities at NE UST Area.

Ward initiates survey in East direction walking lines E-W, advancing from N-S.

1300 Data File 020513A.861 E-W lines 16 lines

1323 020513B.861 N-S (2) lines

1345 TOC ARRIVE ON SITE

SWANSON, HOWELL E-W-S

DATA 020513C.861 ~~E-W LINES~~

020513D.861 2ND AREA

020514D ?

CENTRAL AREA
SPOT 1 - NEAR TRANS PAD
DATA FILE - 020514D.$61 E-W-N
SPOT 2 - PAD, DUMPSTER
Ø
SPOT 3 - ENTIRE COURTYARD
DATA FILE - 020514E.$61 E-W-S
1500 - NE UST Area investigation is being conducted.
- Debris (couches, furnaces, logs) hindering collection of full-coverage data.
- No large area peaks observed in survey area.

02-25-09 Phase II ①

0845 Terra Tech (Galler + Ward) onsite
0850 M+W onsite (David Duncan + Dale)
Conduct safety talk and walk the site to point out hazards
0910 M+W begins to unload, TT organize supplies
0930 M+W begin TWR13

ATD TWR13 3" Concrete
0 0.25 25" Orange sand No color/odor/staining
0.5 - 4 Black silty clay slight odor, 1/4 moist
2 4-10 orange brown clay stiff dry no odors
No groundwater encountered

0945 TWR14 6" concrete
0.5-2 - Black silty clay no odors 1/4 moist (M)
2-5 Dark Brown - same
5-10 Brown same
1005 TWR15 6" Concrete
0.5-1.0 Black silty clay no odors 1/4 M soft
1-3 Dark Brown silty clay - same
3-10 Brown Silty Clay - same

JG

2-25-09 10:25 ②

TWR 17 0.5' Concrete

0.5-2 Black silty clay w/ odors, clay

2-6 Dark Brown Sand

6-10 Brown, Sand, native material

11:00 Hulcher Co (Lazarus) on site

Safety talk - begin work on

North UST area, LEAVE FOR

LUNCH

1120 RETURN TO SITE

1200 BEGIN BORING TWR-16

0-1 SILTY CLAY, DK GREY

1-5 " ", DK BROWN + ORANGE

5-10 SILTY CLAY, BROWN

1215 MOVE TO TWR-12, BEGIN BORING

0-0.5 SILTY CLAY, BLACK w/ GRAVEL

0.5-4 SILTY CLAY, DK BROWN + [illegible]

4-5 SILTY CLAY, DK BROWN

5-10' CLAY, BROWN, SLIGHTLY STIFF

1245 PID MALFUNCTIONED, NO LONGER USABLE

1300 SAMPLE TWR-16 @ 0-5

1310 SAMPLE TWR-12 @ 5-10

1320 MOVE TO TWR-~~16~~ 9, BEGIN BORING

2-25-09

③ 2-25-09

0-2 SILTY CLAY, LT BROWN

2-4 SILTY CLAY, BLACK + DK BROWN

4-10 ~~SILTY~~ CLAY, BROWN, SOFT

1335 SAMPLE TWR-9 @ 0-5', MOVE TO TWR-10, BEGIN BORING

0-3 SILTY CLAY, DK BROWN + GREY

3-10 CLAY, BROWN, SOFT

1350 SAMPLE TWR-10 @ 0-5, MOVE TO TWR-08, BEGIN BORING

0-3 SILTY CLAY, DK BROWN, HEAVY ODOR

3-5 CLAY, BROWN, LOW ODOR

5-10 " ", NO ODOR

1400 BEGIN BORING TWR-07, SAMPLE TWR-08 @ 0-5'

0-3 SILTY CLAY, DK BROWN

3-10 CLAY, BROWN

1435 SAMPLE TWR-07 @ 0-5

1455 MOVE TO TWR-06, BEGIN BORING

0-4 SILTY CLAY, DK BROWN

4-10 CLAY, BROWN

1510 SAMPLE TWR-06 @ 0-5, MOVE TO TWR-05

0-2 SILTY CLAY, DK BROWN

2-3 CLAY, DK BROWN

3-10 CLAY, BROWN

2-25-09 (4)

1530 SAMPLE TWR-05 @ 0-5, DRILL CREW TRAILERS EQUIPMENT

1600 DRILLERS DEPART SITE, SUBSURFACE CONCRETE PAD LOCATED AT EACH SUSPECTED UST LOCATION.

SAMPLE LOG FOR TWR-13, 14, 15 + 17

TWR-13-5-10 955

TWR-14-5-10 1020

TWR-15-5-10 1040

TWR-17-5-10 1145

1615 DEPART SITE FOR OFFICE

1625 ARRIVE @ OFFICE, COMPLETE CHAIN-OF-CUSTODY

2-25-09

(5)

2-26-09

0830 ARRIVE ON SITE, PREPARE EQUIPMENT

0905 MOB TO TWR-02, BEGIN BORING

~~0-5 SILTY CLAY, LT BROWN~~ TW

0-0.5 SILTY CLAY, DK GREY w/ GRAVEL

0.5-2 SILTY CLAY, BLACK

2-5 SILTY CLAY, LT BROWN

5-9 CLAY, LT BROWN

9- REFUSAL

0915 MOVE TO TWR-03, BEGIN BORING

0925 SAMPLE TWR-02 @ 5-9', BEGIN DRILLING TWR-04

TWR-03

0-0.5 SILTY CLAY, DK GREY

0.5-10 CLAY, LT BROWN

0945 SAMPLE TWR-03 @ 5-10

TWR-04

0-1 SILTY CLAY, GREY - BLACK

1-5 SILTY CLAY, BROWN

5-8 CLAY, LT BROWN

8-9 SAND, BROWN, MOIST

9-10 CLAY, LT BROWN

@ ~~1055~~ 0955 SAMPLE TWR-04 @ 5-10

1010 MOB TO SOUTH UST AREA, SET UP @ TWR-18

1030 BEGIN BORING TWR-18

2-26-09

2-26-09 (6)

0-3 CLAY, DK BROWN
3-5 CLAY, LT BROWN
5-10 CLAY, LT BROWN
1045 SAMPLE TWR-18 @ 5-10, MOVE TO TWR-19 BEGIN BORING
[Duplicate TWR-21 will be of sample TWR-18]
0-2 Dark Brown Silty Clay. No O/O/S
2-5 Brown silty clay, Same
5-10 Lt Brown - same
1010 SAMPLE TWR-19 @ 5-10, BEGIN BORING TWR-20
0-1 SILTY CLAY, GREY + GRAVEL
1-6 SILTY CLAY, DK BROWN
6-10 CLAY, LT BROWN
1135 SAMPLE TWR-20 @ 5-10
1140 SAMPLE TWR-20 MS/MSD, NO VOAS AVAILABLE FOR MS/MSD
1210 DRILLERS LOAD EQUIPMENT, SAMPLES PLACED ON ICE
1230 DRILLERS DEPART SITE AFTER FINAL WALKTHROUGH
1245 TETRA TECH DEPARTS FOR OFFICE
1300 ARRIVE AT OFFICE

(7)

2-26-09

LATE NOTES - TWR PHASE II

TOTAL DEPTHS + SURFACE MATERIAL

TWR-2	9'	CC	TWR-13	10'	CC
TWR-3	10'	S	TWR-14	10'	CC
TWR-4	10'	CC	TWR-15	10'	CC
TWR-5	10'	CS	TWR-16	10'	CS
TWR-6	10'	CS	TWR-17	10'	CS
TWR-7	10'	CS	TWR-18	10'	S
TWR-8	10'	CS	TWR-19	10'	S
TWR-9	10'	CS	TWR-20	10'	S
TWR-10	10'	CS			
TWR-12	10'	CS			

S - SOIL, CC - CONCRETE, CS - CONCRETE SLAB (INTERIOR)

TW

- REFUSAL AT 9FT @ TWR-2, NO GROUNDWATER ENCOUNTERED AT ANY SOIL BORING, NO GROUNDWATER SAMPLES COLLECTED.

TW

- N AREA UST - SLAB DISCOVERED 2-3' DOWN NEAR FILL PIPE. SLAB LIKELY COVERS 'GLASS UST. EXCAVATED AREAS BACKFILLED AFTER PICTURES WERE TAKEN
- S AREA UST - SLAB DISCOVERED 2' DOWN NEAR FILL PIPE. SUSPECT PRODUCT LINE OR ~~[illegible]~~ VENT PIPE FOUND UNDERNEATH SLAB. EXCAVATIONS BACKFILLED.

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	TTEMI-05-003-0052	

7-8-09 J. CARUTHERS
1330 - START ON SITE TO MEET FIRST RESPONSE TO CLEAR DEBRIS FOR MIP INVESTIGATION.
* PHOTO LOG ON PAGE 24
1410 - FIRST RESPONSE ON SITE W/ BOB-CAT, BUDDY JONES
1510 - CONTINUE CLEARING DEBRIS & ACCESS TO MIP LOCATIONS.
1545 - FINISH DEBRIS CLEANUP.
1600 - OFF SITE.

J.W. Caruthers
7-8-09

7-9-09
0700 - START - J. CARUTHERS ON SITE.
0750 - VIRONEX ON SITE - CHUCK ~~TAYLOR~~ ABLE, TERRY, CORY GAMWELL.
0800 - H&S MEET. - HEAT, DRILLING EQUIP.
0810 - SET UP MIP & GEOPROBE.
0840 - BEGIN BORING MIP-1, BASELINE BORING AT FORMER TWR-10 BORING LOCATION.
0842 - CAMERON SWANSON - TDEC - DIV. OF REMED. ON SITE.
0918 - MIP-1 REFUSAL AT APPROX. 16.4'
0943 - SET UP ON MIP-2
1025 - T.D. MIP-2 AT 16.95'
1035 - SET UP ON MIP-3
* SEE PROPOSED MIP BORING LOCATION MAP, FIG. 2 FOR BORING LOCATIONS BY BORING #.
1055 - WIRT PIPER - 364-2827 PROPERTY TO SOUTH - BUSINESS FURNITURE WAREHOUSE, STOPPED BY, SHOWING SOME INTEREST IN TWR PROPERTY
1115 T.D. MIP-3 AT 21.65'
1125 - SET UP ON MIP-4
1155 - T.D. MIP-4 AT 18.35'

J.W. Caruthers
7-9-09

7-9-09

1205 - SET UP ON MIP-5
1215 - LUNCH
1245 - CONTINUE MIP-5
1330 - T.D. MIP-5 AT 18.45'
1350 - SET UP ON MIP-6
1423 - T.D. MIP-6 AT 20.45'
ALL BORINGS HAVE GONE TO REFUSAL.
1440 - SET UP ON MIP-7
1515 - T.D. MIP-7 AT 21.35' REFUSAL.
1525 - SET UP ON MIP-8
NOTE - ECD GRAPH IS BEST DETECTOR FOR PCE, IF ECD PEAKS & FLAT-LINES, THEN THE PID GRAPHS SPIKE IS MOST LIKELY THE HOTTEST ZONE.
1605 - T.D. MIP-8 AT 17.55' REFUSAL.
1615 - SET UP ON MIP-9
1644 - TERMINATE MIP-9 AT 10.35'
NO REFUSAL, BUT HARD DRILLING, ALSO GRAPH RESPONSE WAS DROPPING OFF.
1650 - SET UP ON MIP-10
1723 - T.D. MIP-10 AT 17.45' REFUSAL
BREAKDOWN TO END SHIFT.
1800 - OFF SITE

G.W. Caruthers 7-9-09

7-10-09

0700 - START - J. CARUTHERS ON SITE
0740 - VIRONEX ON SITE
0800 - H&S MEET. HEAT, DRILL EQUIP.
SET UP ON MIP-12
0850 - T.D. MIP-12 AT 20.15' REFUSAL
0903 - SET UP ON MIP-11
0941 - T.D. MIP-11 AT 20.35' REFUSAL.
0955 - SET UP ON MIP-13
1030 - T.D. MIP-13 AT 17.05' REFUSAL.
1200 - T. WARD & S. HARRIGAN DECIDE TO ADD 3 MIP BORINGS #14, 15, & 16 - SEE FIG. 2.
1210 SET UP ON MIP-14
1300 T.D. MIP-14 AT 18.85' REFUSAL.
1320 - SET UP ON MIP-15.
1400 - T.D. MIP-15 AT 21.65' REFUSAL.
1410 - SET UP ON MIP-16
1452 - T.D. MIP-16 AT 21.55' REFUSAL.
1520 - PREP. TO CONFORMATION SAMPLE

TIME	SAMPLE
1530	MIP-16-5'-10'
1555	MIP-15-2'-7'
1610	MIP-10-2'-7'
1630	MIP-4-2'-7'

1700 OFF SITE G.W. Caruthers 7-10-09

6

7-11-09

0700 - START - J. CARUTHERS ON SITE

0720 - VIRONEX ON SITE.

0730 - H&S MEET. HEAT & DRILL

TIME	SAMPLE
0800	MIP-11-6'-11'
0830	MIP-14-1'-6'
0905	MIP-1-5'-10'
0920	MIP-2-2'-7'
0940	MIP-6-3'-8'
0950	MIP-7-4'-9'
0905	MIP-DUP-FROM MIP-1

~~[illegible]~~ gwc

1000 - FINISH SAMPLING, PLUG & ABANDON 26 BORINGS.

1100 OFF SITE - END PROJECT.

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Chuck Terry
Certified MIP Specialist
cterry@vironex.com

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J.W. Caruthers
7-11-09

TWR-MIP PHOTO LOG 7-8-09

1405-W-DUMPING OUTSIDE ENTRANCE
1408-SW-ENTRY GATE DOWN
1410-W-DEBRIS
1411-W- "
1412-W- "
1413-W- "
1414-W- "
1419-NW-DEBRIS IN DOORWAY
1420-SW-DEBRIS INSIDE N. BLDG.
1423-S- " " "
1424-E- " " "
1426-NE- " " "
1430-E-FIRST RESPONSE PILING DEBRIS
1435-SE-DEBRIS DUMPED IN S. BLDG.
1445-SW-FIRST RESPONSE CLEARING DEBRIS.
1538-~~SW~~-AFTER DEBRIS CLEANUP
1538-S- " " "
1538-SE- " " "
1539-SE- " " "
1542-SW- " " "
1543-W- " " "
1544-N- " " "
1544-NE- " " "
1545-SW- " " "
1546 S-DEBRIS PILE.

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0855-NE-MIP SET UP ON BORING MIP-1
0900-SW-MIP VAN.
0902-S-MIP VAN.
0903-E-INSIDE MIP VAN.
1030-NW-VANDALS HASP
1334-S-MIP RIG SET UP ON MIP-5

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0829-SW-MIP SET UP ON MIP-12
1340-NE-MIP PROBE ON MIP-15

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0805-W-MIP CONFORMATION SAMPLING.
1002-NE-SITE AS LEFT AFTER MIP.
1002-SW- " " "
1003-S- " " "
1006-N- " " "
1007-W- " " "
1007-W- " " "

J.W. Carruthers
7-11-09